INDIA RUBBER WORLD

Volume 82 | September 1, 1930 | Number 6

Henry C. Pearson, F. R. G. S., Founder

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Published on the first of each month by Federated Business Publications, Inc., 420 Lexington Ave., New York, N. Y. Publishers of *Antiquarian, Automotive Electricity,* India Rubber World, *Materials Handling & Distribution, Music Trade Review, Novelty News, Radio-Music Merchant, Rug Profits, Sales Management, Soda Fountain, Tires;* and operates in association with *Building Investment, Draperies,* and *Tire Rate Book.* Cable Address, Elbill, New York. Subscription $3.00 per year postpaid in the United States; $3.50 per year postpaid to all other countries.

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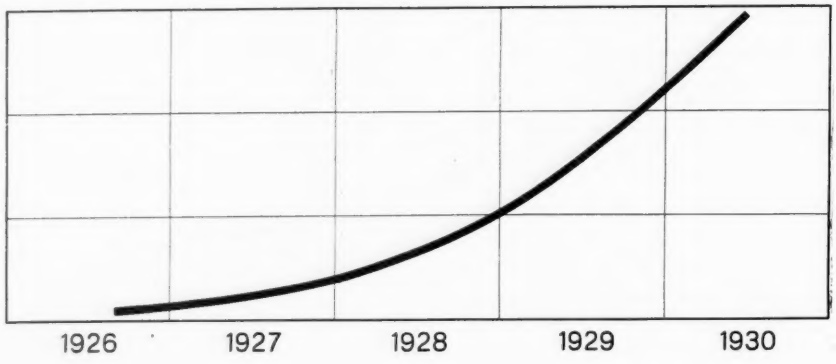

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INDIA RUBBER WORLD

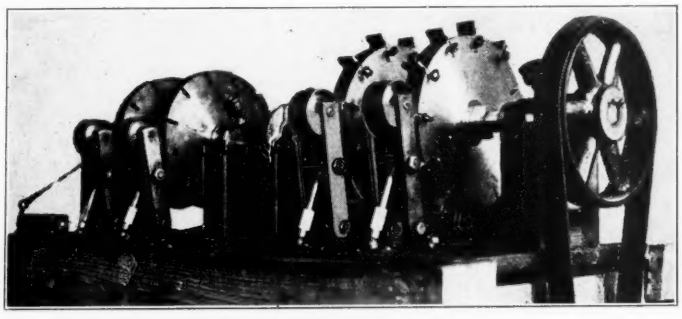
Published at 420 Lexington Avenue, Graybar Building, New York, N. Y.

Volume 82 **New York, September 1, 1930** **Number 6**

Flexing Machine for RUBBER TESTING

E. W. BOOTH [1]

TESTS on vulcanized rubber compounds are constantly being devised to ascertain as rapidly and as accurately as possible the results that normally may be expected of the stock in service. Such tests are very desirable in that valuable indications may be obtained in the laboratory without the necessity of waiting for results to be developed after weeks or months of actual service of the fabricated article. Although it is always desirable that the laboratory results be checked so far as possible by actual road or other service tests, yet the laboratory tests are most important and very desirable in that quicker results are realized and the less satisfactory of the rubber compounds are eliminated from further consideration. In this way the number of service tests that may be desired or required are materially reduced in number; while the changes that may be needed in a rubber stock can be accomplished more quickly.



Modified India Flexing Machine

Several laboratory tests have been developed during the past few years that are now recognized and accepted as standard tests, the results of which approximate those obtained from actual service. For example, the exposure of rubber stocks for eight to twelve hours to ultra-violet light indicates very clearly the effect of several months' sunlight upon these stocks. Furthermore, the accelerated aging tests, whether carried out by the Bierer-Davis oxygen bomb method or by the Geer oven method, are recognized as indicating very accurately the manner in which a stock will age in months or even years of service. The abrasion test is also recognized as an accelerated test that quickly indicates the wear resistant qualities of a particular type of rubber stock.

More recently rubber manufacturers have become greatly interested in determining the resistance to flexing of tire stocks and particularly of tread compounds. Several machines have been devised to determine as rapidly as possible the flexing qualities of a stock, but as yet no one machine has been widely accepted or adopted as a standard.

While to a certain extent the cracking of a tire tread may be greatly affected by choice of a tread design and by proper compounding of the rubber stock, yet a real need is to investigate the causes of tread cracking and to evolve suitable means to overcome or delay the failure of a tread due to cracking. After many months of study in our laboratories two flexing machines were developed which have proved of material assistance in our investigation of flexing and in the testing of tread stocks.

It was first decided to study the flexing of tread stocks under constant load per unit area and under controlled temperature conditions. To accomplish this object the flexing machine, Figure 1, was constructed. The tread stock to be tested is cured in the shape of a strip 8 inches long, 1 inch wide, and ¼-inch thick. The test strip is firmly held between the four rollers, one only being shown at *B*, by clamps *A* on the under side of each wheel, *W* and W_1. The load is applied first by means of a compensating spring *S* and further by filling the air reserve tank *T* with air until a pressure is reached sufficient to effect a 50 per cent elongation of the test piece. To determine accurately this elongation the test piece is marked with two parallel lines 2 inches

[1] The Rubber Service Laboratories Co., Nitro, W. Va.

apart. When these lines have become 3 inches apart, the test stock has been elongated 50 per cent of its original length. The test strip passes through two other rollers, R and R_1, which are moved up and down by means of an off-center cam mounted on a shaft making 220 revolutions per minute. Thus the strip is flexed twice to a right angle or approximately to this extent by each revolution of the shaft. The cylinders C and C_1 are sealed, and the top of each cylinder above the piston is filled with oil. Each cylinder has four rings. The use of oil aids in keeping these cylinders airtight. The compensating or preloading spring was found necessary to avoid working with very high air pressure. By means of a spring balance it was found that a pressure of 48 pounds was required to elongate a particular tread stock 50 per cent. This figure, of course, varies with different stocks but gives an idea of the amount of force required for this test.

Since the line drawn from the extremes of the flexing rollers R and R_1, making the tangent of the four rollers indicated at B form a square, all sides are equal, and flexing per unit area of the test piece is produced. The air pressure is retained; therefore flexing is brought about under constant load, or the load, whatever it may be, required to elongate the test piece 50 per cent. The temperature was controlled by placing the machine in a constant temperature tested room maintained at 70° F.

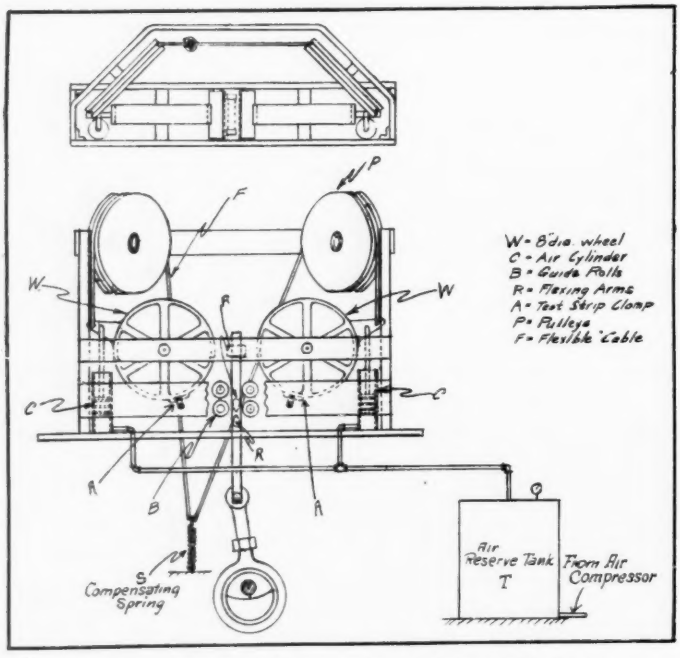


Fig. 1. Flexing Machine—Constant Load Per Unit Area

No particular reason exists for choosing a 50 per cent elongation of the test piece except to shorten the time required to realize a failure of the test strip. The time so required appears to vary inversely with the load applied, the greater the load, the less the number of flexings before failure. Work has been carried out on various elongations of the test strip from 0 to 50 per cent and no marked differences were found between the controls, except the length of time required to produce failure.

Although the machine described has given satisfactory results in practice, it possesses one serious defect in that from four to eight hours are required to complete a single test. In order that a greater number of tests could be performed simultaneously, thereby increasing the capacity of a single machine, an entirely different type of flexing machine was devised. This machine is a modification of the so-called India flexing machine previously described by Torrance and Peterson[2].

The modified machine, Figure 2, consists of four wheels W, W_1, W_2, and W_3 rotating at a speed of 420 R.P.M. Each wheel has twelve slots placed equi-distant from one another along the circumference. Each slot has a half round hole ⅛-inch in diameter corresponding to a similar indentation in the test piece for inserting a pin to hold the test piece firmly on the wheel. The test pieces of stock project from the wheel and are flexed twice to a right angle at each revolution of the wheel by contacting against roller R. The rollers are mounted on a shaft and are as nearly frictionless

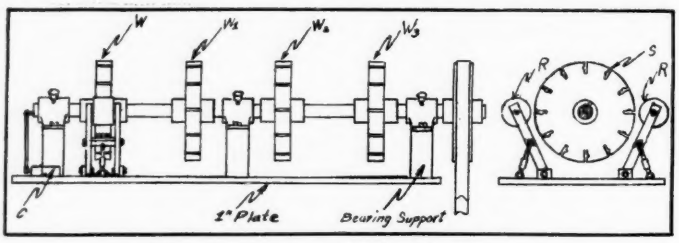


Fig. 2. India Type Flexing Machine

as possible. The rollers are slightly convexed in order to produce flexing on a straight line instead of on a curved line and are also adjustable, that is, they can be moved closer to or away from the wheels. It has been observed that very little abrasion of the test pieces takes place during the test and no deposit forms on the rollers. Any tendency to abrasion can be lessened by dusting the rollers with a fine grade of talc. A counter C is attached by an arm to the shaft on which the four wheels are mounted and automatically records the number of revolutions of the wheels. The number of flexings to which the test pieces are subjected are, of course, twice the number of revolutions recorded.

The method of procedure adopted is to employ three test pieces of each material to be tested. The test pieces employed are 1½ inches in length, $\frac{3}{16}$-inch in thickness, and 1 inch in width, with two half-circle indentations, one ⅛-inch in diameter for fastening the test piece on the wheel, the other 9/32-inch in diameter for concentrating flexing to that particular section of the piece. Since there are 48 slots in the four wheels, this permits testing at one time twelve materials and four controls; this enables the making of a direct comparison on each wheel.

As a result of investigating a large number of tread stock compounds, the following two have been selected as base stocks for the controls:

	A	*B*
Smoked sheets	100.00	100.00
Carbon black	40.00	40.00
Zinc oxide	10.00	10.00
Stearic acid	.....	1.00
Tackol	2.00	1.75
Sulphur	2.75	2.8
Diphenyl guanidine	1.25	.....
A-16	.....	2.4

The cures selected for the flexing tests are 40 minutes at 50 pounds' steam pressure for the A stock and 1 hour 15 minutes at 30 pounds' steam pressure for the B stock. These cures are very slightly under the optimum cures of the particular stocks as has been determined from the repeated

[2] "A New Flexing Machine for Rubber," India Rubber World, July 1, 1929, p. 62.

physical tests that were made on the rubber stock.

A number of cures of the above control stock *A* carried out for different times and at different steam pressures, and also a similar stock in which the ratios of sulphur and of diphenyl guanidine were varied, showed that the most desirable results were obtainable by using the control stock set forth above. For example, a stock similar in composition to stock *A* above given, except that 3 per cent sulphur and 1 per cent diphenyl guanidine respectively were employed in place of the quantities specified, was found to fail under one million flexings while the stock *A* selected as the control was found consistently to withstand approximately three million flexings without failure.

The effect of any material to be tested is ascertained readily by incorporating the material into the control stock before vulcanization and determining the difference in flexing properties shown by this stock in comparison with the control. Ordinarily, 1 per cent of the anti-flexing material is added to the base stock.

As a result of a large number of tests carried out in studying the flexing of tread stocks, a number of general conclusions have been drawn. While in general the addition of an antioxidant to a tread stock increases the resistance of the stock to flexing, yet the effectiveness of any product as an antioxidant does not indicate necessarily the value of such material as an anti-flexing agent. Since the addition of many materials affect the cure of the stock, either by varying the time required for the cure or in other ways, an allowance must be made for this in interpreting the results of the flexing tests. Thus, in general, an overcured stock will fail at a lesser number of flexings than will an undercured stock.

Furthermore, if the anti-flexing agent added to the stock increases the hardness of the rubber compound, the number of flexings the stock will successfully resist will be decreased. If the added material does not stiffen or soften the stock, the results of the flexing test cannot be predicted. If the added material softens the stock without producing any deteriorating action, the number of flexings without cracking will be increased. By operating as described, a number of materials have been found that materially increased the resistance of the control stock to flexing. In some instances the control stock *A* was found to endure as many as six million flexings without any serious cracking.

The *A*-16 base stock previously mentioned and referred to as stock *B* was also completely investigated and tested before adoption. It was observed that variation of the carbon black ratio between 38 and 44 per cent appeared to have no appreciable effect on the flexing results.

From a study of the flexing results of stock *B* it was found that this stock would consistently withstand approximately six million flexings and was more resistant in this test than was the base stock *A* (a diphenyl guanidine stock) to which one per cent of an antioxidant had been added. In fact the *A*-16 stock, by the addition of antioxidants, in the majority of cases was not improved as regards resistance to flexing. While the *A*-16 tread stock was found to be highly resistant to flexing, the diphenyl guanidine stock without any added agent was found to be the least resistant in these tests. The next most favorable results in the flexing tests were obtained by the use of other aldehyde-amine type of accelerators. It was observed that stocks cured in the presence of this class of accelerators possessed very desirable and high anti-flexing qualities as well as high antioxidant qualities.

In a general way the results obtained by employing the modified India type flexing machine described are quite consistent and have been found to compare with results obtained from actual road service tests of the tire tread stock. Variations in the laboratory results of 25,000 or 50,000 flexings mean but little in actual road tests but the laboratory results are indicative of what may be expected from the stock in service.

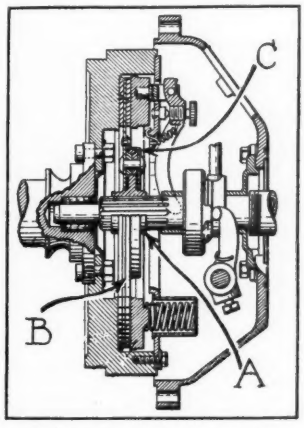
It is not safe to assume that because a given stock fails only after twice the number of flexings at which another stock fails, that one tread will give twice the mileage of the other. It is safe to conclude, however, that under equal conditions of wear one tread would resist failure due to cracking approximately twice as long as the other. In general, it can be concluded that the larger the number of flexings before cracking, the longer the tread made from that stock will resist cracking in service. Accordingly, the results obtained from the tests have been of real value.

The flexing machine described is not recommended as perfect from every point of view. Improvements are being considered which will permit the determination of an end point short of complete failure of the test strip and to cause flexing under a constant load. With these improvements the flexing machine described should give even more satisfactory results than are obtained at present.

Rubber Cushioned Driving Clutch Eliminates Noise and Vibrations

RUBBER is embodied in an improved form of friction clutch of the disk type for automobiles. It is applied to cushion the mechanical shocks and to dampen the transmission vibration.[1]

In this device, referring to the figure, the movable hub *A* is provided with a circumferential flange perforated at six equally spaced points. Extended into each perforation from its opposite ends are two rubber plugs axially perforated. These plugs are united into companion series by comparatively thin rubber rings having a radial dimension greater than the plug diameter. The disk *B* is axially bored to receive loosely the hub *A* and is perforated to register with the bores of one set of the plugs.



Rubber Cushioned Clutch

Secured to disk *B* and bored to receive loosely the hub *A* is a shallow cup *C* perforated to register with the opposite companion series of plugs. When assembled, rivets are passed through hub flange *A*, disk *B*, cup *C*, and the rubber plugs in such manner that the plugs meet end to end in compression.

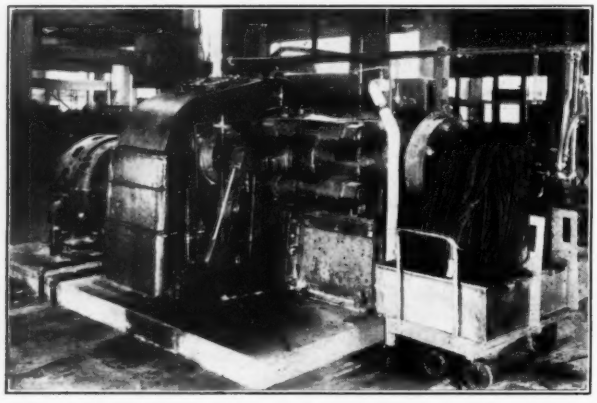
In this way hub *A* and disk *B* are elastically connected, and the assembly transmits the driving torques and eliminates noises and vibrations due to inaccuracy of alinement of shafts and to mechanical shocks in the transmission gearing.

[1] United States Patent No. 1,767,566, June 24, 1930.

FROM TIME TO TIME THE LAY PRESS HAS GIVEN MUCH space to progress in the synthesis of rubber; but while that problem has been pushed somewhat nearer to completion, it is still far from a commercial success. To find plenty of raw materials sufficiently low in price to compete with the abundance of latex offers a real difficulty. The producers of natural rubber are alive to the situation and look to increasing production through bud grafting, the application of fertilizers, seed selection, and other scientific methods.

Cleaning Rubber by Straining

J. P. MAIDER [1]



Cylinder Type Straining Machine

ONE of the outstanding problems connected with crude rubber has been a question of lack of cleanliness and freedom from such foreign substances as bark, leaves, sand, and wood splinters. Of these a large percentage, we might say practically all, is closely associated with existing methods of latex treatment and preparation of the rubber at the plantations. This fact is impressive when it is realized that of all the so-called plantation rubber, which amounts to about 850,000 tons annually, at least 50 per cent is native rubber, produced under crude, careless conditions prevalent throughout the jungles. The remaining 40 to 50 per cent produced on American and European plantations represents, for the most part, clean rubber, as far as plantation contamination is concerned. Then there is that contamination taking place during transit and storage and, last but not least, wood splinters from the box-opening process.

So much for the situation as it exists. The problem is to clean this dirty rubber so that it will be satisfactory for use.

Washing has been resorted to for many years, and the operation is so generally known as to make any discussion of the method at this time unnecessary. Washing does have certain definite limitations, however, although it is fairly satisfactory for surface contamination. It is not positive in nature, is of little value for removal of deeply embedded foreign material, and is particularly ineffective on sand.

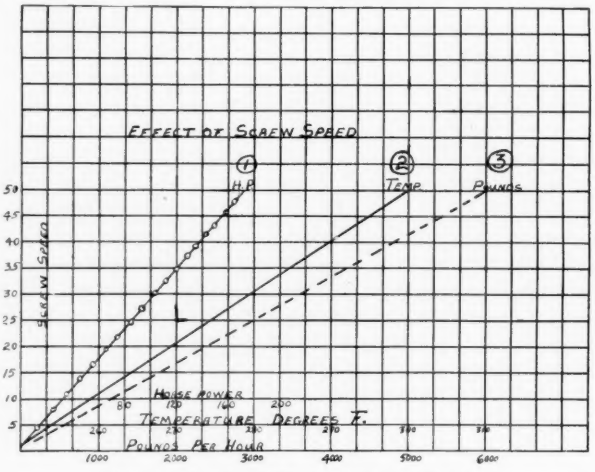
While several types of strainers exist, they are all of the extruding type of machine in which the material is forced by means of a screw through screens or perforated plates. This screen may be in the form of a flat disk or plate at the end of the screw, or the screening surface may surround the screw as a cylindrical head. My remarks will be limited entirely to the latter type of strainer, briefly described as follows:

1. A barrel capacity of 125 pounds of rubber.
2. Power requirements, 85 to 110 h.p. at 32 r.p.m.
3. The barrel is jacketed for cooling water.
4. Barrel dimensions, 11½ inches, inside diameter.
5. Screw pitch, 6½ inches, length 56 inches.

The screen construction is a perforated plate screen with .026 diameter holes, 20 per linear inch.

Dimensions, 17 by 36 inches, one inch overlap; straining area, 124 square inches. A number 5-mesh screen is used on either side of this plate for protection.

One important fact must be borne in mind in straining rubber and that is that premastication is necessary. The crude rubber should be given a preliminary breakdown and fed directly into the strainer. The strainer is usually operated at a screw speed of 30 to 35 r.p.m., although others may be used, as will be shown later. After straining, the rubber is handled in any convenient manner common to broken-down rubber. So much for the actual operation of the process. But what are some of the factors connected with straining? The following conclusions will state these definitely.



Graph Showing Effect of Screw Speed

1. Crude rubber must be premasticated for straining. The plasticity or toughness of the rubber is still further reduced in the straining operation to nearly constant value, which is more or less independent of the plasticity feed.
2. Rate of straining. This is dependent on screw speed and cleanliness of the rubber. Ordinarily 3,000 pounds per hour is considered normal. Screen changes vary with the condition of rubber, but a fair figure is a screen change per 7,500 pounds strained.
3. Increase in temperature is proportional to screw speed up to 50 r.p.m. with any decided rise due to a plugged or dirty screen. The maximum temperature should be 325° F., the melting point of rubber.
4. A variable speed motor drive offers flexibility in operation and is recommended.
5. The cost of straining is comparable to washing and should be less than one mill a pound.
6. Any type of rubber that is not too soft or too dirty may be strained satisfactorily.
7. Horsepower requirements, production rates, and temperature increase are directly proportional to screw speeds up to 50 r.p.m. Higher screw speeds have not been tried, although a flattening out of the output curve is expected.

[1] Goodyear Tire & Rubber Co., Development Department, Akron, O. Paper read before the Akron Group, Rubber Division, A. C. S., May 12, 1930. Publication permitted by *Ind. Eng. Chem.*

Wild Rubber of the Amazon

Can Brazil Reestablish Premiership as a Rubber Producer? With Wild Rubber, Even Though Superior, Certainly Not, Replies Treadwell, Internationally Known Planting Expert

JOHN C. TREADWELL

A REPORT on recent explorations in the Amazon holds out the hope for Brazil that the Amazon Basin is destined to become the world's most important source of rubber, and special stress is laid upon the possibilities for lowering costs by systematic organization of the present industry of exploiting rubber from the forests, but due stress is not made of the potentialities awaiting intelligent attack of the cultivated rubber problem.

In speaking of the superior quality of Amazon rubber, it should be borne in mind that the finest grades are generally produced, not in Brazil, but actually in Bolivia, and from this highest grade of upriver fine hard Para, grades descend to medium soft and nondescript varieties which are graded below plantation crepe and smoked sheet.

Upriver Fine Rubber Ready for Shipping

It is generally understood that the highest grade of rubber is the carefully prepared type from the upper Amazon, and many experts believe that the quality is, in part at least, due to inherent characteristics of latex from certain types of trees. Others attribute the quality to the method of preparation and the curing effect of combustion products from the nuts employed for smoking the balls.

Perhaps if plantation rubber were to be prepared in a similar manner, a like effect might be obtained. The method in the Amazon has for one effect sealing the preceding coagulations by subsequent additions of coagulum, thus effectively excluding the inner layers of the ball from the oxidizing effects of the atmosphere.

On the other hand, the smoking processes employed in the East Indies do not imitate the process as employed in the upper Amazon except in employing smoke as a curing agent: otherwise the sheets are hung singly in the drying sheds, each with its maximum surface exposed to the oxidizing action of the atmosphere of the smoke house. In most cases artificial circulation is maintained during drying. The Amazonians employ a high temperature for a short period, accomplishing smoking and coagulation in one operation. The plantations employ a low temperature for extended periods after coagulation with acetic or formic acid.

In the preparation of upriver fine all of the serum is retained and evaporated on the ball with the coagulating rubber, while on the plantations the serum is in part, at least, run to waste; a portion and possibly the more undesirable part is retained with a part of the acetic acid in the rubber to go through the many reactions which may be brought about by the action of prolonged application of heat, air, and humidity in the smoke house. In the Amazon coagulation and curing are carried out in open sheds with full access of light and at times in direct sunlight. The plantations carefully exclude light and especially direct sunlight from the smoke houses.

Granting that upriver fine is the finest grade of rubber produced, the Amazon produces large quantities of soft and inferior rubbers, reputedly from Hevea, and it is well known that some trees yield weak rubber and others firm. The *seringueiros* are so well acquainted with the fact that they designate the variable types of trees by different names and have thus formed a nomenclature as a rough basis of classification. They have *preta, rocha, vermelha,* and *branca* to designate supposed varieties with varying bark and cortex colorations. Some of the colors are not due to any part of the trees but to lichens adhering firmly to the bark. Other colors are to be found in the cortex and in some cases appear constant for certain types of Hevea.

However, there are high and low yields of nearly all of the exploitable types of Hevea in the Amazon and there are some Heveas which exhibit to the unpracticed eye all the characteristics of latex producers, yet do not produce latex at all.

The statement has been made so often that Wickham gathered his seeds from the poorest Hevea district of the Amazon, and that Amazon rubber from fine trees never seen by Sir Henry will always be superior to plantation rubber.

It is probably beyond question that all Heveas in the basin of the Amazon are hybridized and have drawn their strains from the supposed pure species of the rim of the Amazon basin where types appear to persist in restricted localities. But even in those regions stands of exclusive varieties are almost nonexistent or have for near neighbors trees of distinct species.

A study of the value of types from the standpoint of yield discloses the fact that some of the trees of the Wickham district have records as high as the renowned high yielders of Bolivia, and specifically some of the trees planted at Boim at the time Sir Henry obtained his seeds hold production records comparable to the highest yielders. Likewise, individual trees in the East have yields well over the rate of 1,000 pounds per acre.

In Trinidad is a high yielding tree planted directly from seeds sent from Kew Gardens after Wickham had delivered them. Unquestionably the seeds of Wickham were of hybridized stock which had for parents probably all the known varieties of the region. And this stock, when it was transported to the East Indies, lost the opportunity for further accession of pure strains, but a new condition was brought about by the planters who employed seeds indiscriminately and thus laid the foundation for new strains and types which will be peculiar to the plantations.

The developments in budding give promise of creating an enormous increase in the production of the new plantations, and it is estimated that 250,000 or 300,000 acres have already been planted to budded stock, capable of producing from 1,000 to 2,500 pounds per acre. Areas of trees planted with selected seeds rendering from 1,000 pounds to 1,500 pounds per acre are known. Practically all of the mother stock for these developments came from the same source; and had ordinary plant selection methods been applied in the first place, 85 per cent of plantation trees would now be high yielders instead of the oft-stated 15 per cent. Potentially then, it appears that rate of production per tree in the East Indies will, in the future, exceed that of the wild rubber of the Amazon.

While we have been led to believe that the yield of trees in the Amazon is phenomenal, reports of high yields are always based on selected examples of individual trees or of limited areas, and there are records of yields from individual trees and areas which show production per man far to exceed experience on the plantations. However, excluding these special cases the average yield of the trees of the Amazon Basin is probably not greater if at all in excess of the plantations of Malaya.

The planting industry organization in the East Indies has reached a high state of efficiency and, given proper yielding strains of trees, these organizations can always maintain production at the minimum cost.

Organization in the rubber industry of the Amazon is on the ancient patriarchal system. The *seringueiros* work independently, and supervision in the forest is almost wholly lacking. But the greater part of the valley has been thoroughly prospected and only the more inaccessible regions remain for the prospector's discoveries.

The cost of production in the Amazon varies with the market price of rubber as *seringueiros* work on a participation plan, but except in times of high prices they will be found working for the most meager necessities of life.

Efficient gathering methods as applied to forest conditions would be hard to establish on account of the sparsity in stand of the trees, but by systematic organization present methods could probably be improved upon. The size of an *estrada* is nominally taken as 120 trees, and the *seringueiro* considers tapping and collection from this number as a task. Some of the operations in the Amazon have always been on a huge area, and their very magnitude constitutes a handicap to proper and efficient administration.

A general statement that Amazon trees yield more than those of the East Indies is misleading, as trees of the full range of potential are to be found in both localities. There are undoubted strains of high yielders in the upper Amazon, and examples of these varieties are quite common in the East. On the other hand, many of the *estradas* of the Middle Amazon yield even lower per tree per year than even poor plantations in Malaya. It is true that some of the oldest plantations in Malaya suffered a diminution in yield, but since the knowledge gained by systematic alternate tapping methods has been put into effect, yields have increased rather than diminished.

It is a mistake to consider the trees of the Amazon as more healthy than those of the cultivated areas. Probably all the diseases known to attack Hevea are to be found in the Amazon. Leaf blight, brown bast, black stripe canker, pink disease, wet root rot, and various root disease are all to be observed. The casual observer notes the strong sturdy growth, of the age-old Heveas which have withstood the attacks, but he does not take into account the millions of seedlings that have perished in the unequal combat for existence. In fact, were Hevea sturdy enough to overcome encroachment of surrounding vegetation, the whole Amazon Valley would now be a forest of Hevea from the vicinity of Para to the lowlands of Colombia, Ecuador, Peru, and Bolivia.

High Yielding Hevea Growing in the Upper Amazon

High Yielding Hevea Planted from Wickham Seeds at Boim on the Tapajos River

Cameta or Coarse Para also Known as Sernamby, Negroheads

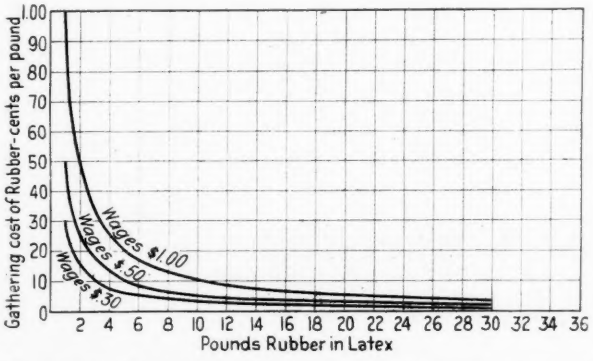
If cultivation in the Amazon is ever undertaken on a really systematic basis, the same plans for tree sanitation will have to be made as in the East.

While it is true that important production in Malaya may not be expected before the sixth year after planting, the same holds true in the more favored regions of the Amazon, but some examples of cultivated rubber failed to show satisfactory production even after 15 years.

Potentially the Amazon is the one greatest district for the cultivation of Hevea, and there are millions of acres contiguous to the main water ways which at present are in wild jungle. There are 800,000 square miles of possible rubber lands in the area proven to support the growth of Hevea to maturity and to very old age. The total area under cultivation in the Orient will not exceed 10,000 square miles.

Thus, if labor were available and other conditions were favorable, it would be possible to add to the present world's supply eighty times the present production of the Indies. However, the apparent sources of labor are not adequate to man even a small percentage of this great area in the Amazon Basin.

In the East Indies it is estimated that one laborer is employed on each 3 to 5 acres, or say 1,300,000 to 2,000,000 for the whole industry. The estimated total population of the Amazon is 1,525,000 from which it may be seen that to duplicate the production of the East every man, woman, and child in the Amazon would have to be employed in rubber tapping.



Illustrating Diminishing Differential in Gathering Cost of Rubber as Production Increases at Varying Wage Scales

The actual population dependent upon rubber production in the Amazon is probably 450,000, while those gainfully employed in the tapping industry will probably not exceed 150,000, resulting in one effective worker to each 3,418 acres or a disparity of 1,000 to 1 as compared to the concentrated conditions on eastern plantations.

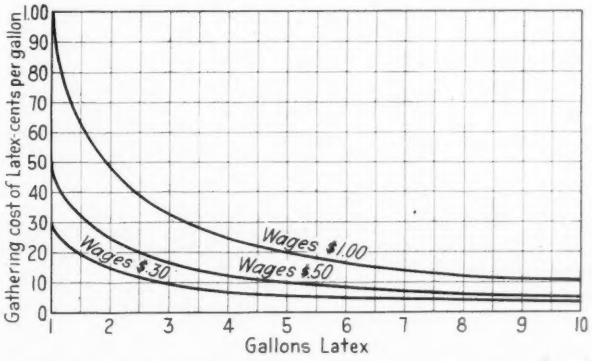
The question of labor supply is the prime deterrent even for moderate undertakings. Wages, where paid as such, are on a basis of 60 cents gold per day as compared with 25 or 30 cents in Malaya. The tendency in both regions is towards higher levels, and the Brazilians hope for $1, while the wage level in the East Indies may be expected to become stabilized for some time to come if the daily rate reaches 50 cents gold.

The question of disparity in wages, then, even though the labor supply were adequate, appears at first view to constitute a permanent handicap; but if the Brazilians were to develop plantations with strains of high yielders in regions accessible to deep water transportation, the disparity in wages would not constitute a serious handicap, for, as the rate of production increases, the cost per pound at high wages diminishes much more rapidly than does the cost at low wage rates, while fixed charges remain the same per pound, regardless of gathering costs.

With comparative wages at $1 and at 50 cents the gathering cost per pound at the higher rate will always be double that of the lower, and, for example, were the production per man in each case to be only 5 pounds per day, the labor cost at the higher rate would be 20 cents and at the lower rate 10 cents, manifestly a prohibitive spread. And if the rate of production were to be 10 pounds, then the comparison would show 10 cents for the higher and 5 cents for the lower. But if the production in both cases were to be 20 pounds per day, then the difference would be 2½ cents per pound, which easily might be absorbed by efficient management, economical overhead charges, economies in packing, freight rates, concessions in taxes, etc. And were the production to reach 25 or 30 pounds, the difference would be 2 cents or less as the case might be.

Much wider variations in cost exist on well established plantations of the East Indies and in the wild rubber producing areas of the Amazon.

Discussion of the quality of rubber and its different grades is perforce concerned with rubber after its conversion from latex to the solid form, and comparative costs of production have heretofore been made on the basis of finished crude rubber. But it might be profitable for those interested to give some thought to the cost of producing and shipping latex from the Amazon, as compared with Malaya.



Illustrating Diminishing Differential in Gathering Cost of Latex as Production Increases at Varying Wage Scales

A great deal of energy and inventive genius is being expended on the problem of utilizing latex in the consuming centers. Many new uses have been discovered, and it now finds application in waterproofing, in paper making, in the shoe, leather, and artificial leather industries. Besides latex is being experimented with for numerous purposes which have not been brought to public attention.

Rubber manufacturers employ latex in ever-increasing quantities. It finds application in the manufacture of automobile tires, in dipped goods, and the like, and recent developments indicate that electro-deposition of rubber direct from latex bids fair to assume an important place in some of the processes of rubber manufacture. But the more advanced thinkers in the industry dream of the day when present cumbersome methods of rubber compounding shall have been displaced by modes of incorporation whereby latex and compounding ingredients shall be mixed in water suspension in such manner that perfect dispersion of all ingredients shall have been effected.

With the prospect, then, of future demand being created for increasing quantities of latex, consideration of production costs and transportation facilities must take into account a different set of factors from those employed for estimating the cost of solid crude rubber.

Latex can be concentrated and prepared for shipment as easily in the Amazon as in the East Indies and can be transported from Para in from 12 to 14 days, while the time consumed on the voyage from Singapore to New York is from 30 to 40 days.

The gathering cost of latex, as in the case of crude rubber, will be higher in the Amazon than in the East, but as in the case of crude rubber the disparity decreases with increasing yield and man-day production, to allowable limits of variation in cost, as illustrated in the accompanying graphs.

Considering the Amazon from the standpoint of latex production from high yielding trees, the disadvantage of higher wages is not so great as for the production of standard rubber, as the factory cost of preparation does not have to be considered.

Brazil has long enjoyed the reputation established before the great decline in the price of rubber, and the Brazilians find it difficult to adjust their ideas to the condition brought about by the growth of the plantation industry. They constantly refer to their rubber as the finest in the market but are apparently not impressed by the disparity in production between 25,000 for Brazil and 900,000 to 1,000,000 tons as the world's potential.

Can Brazil ever reestablish premiership as a rubber producer? With wild rubber, even though superior, certainly not. The only alternative then would be to encourage intensive cultivation of the highest yielding strains of Hevea. It would be folly to plant with unselected seeds or without developing budded stock, but to select seeds with guaranty of satisfactory results requires careful supervision of the highest type of geneticists and plant breeders, and in any case some years must necessarily elapse before results can be shown to be satisfactory or disappointing. To bring budded stock to a satisfactory type of proven clone is the work of years. The shortest time for proof will probably be from 17 to 20 years.

The Brazilians will not go to the Amazon to accomplish this task, and thus the alternative will be development by foreign companies who will have to be assured liberal and fair treatment, an abundant labor supply at wages to compete with more densely populated countries, and an entire readjustment in social and commercial outlook from that existing at present.

The Amazon may be drawn in simile to a dynamo with the greatest potential in the world whose source of power is cold and along whose wires no current flows. She has the greatest potential rubber producing district in the world, and who can forecast what evolution the future may bring forth? Were the available lands in the valley to be brought under cultivation even by obsolete plantation methods, the Amazon could produce 80,000,000 tons of rubber per year.

Were the area to be planted with only moderate budded stock, her yield would reach the astounding annual total of 350,000,000 tons, but 800,000 square miles is equivalent to 512,000,000 acres, to man which over 100,000,000 plantation workers would be required; in other words, over double the present total population of all Brazil and one hundred times actual plantation workers.

However, if the pioneer now undertaking large scale development of rubber on the Tapajos meets with only moderate success, extended activity may be looked for as the proximity to the United States, ease of transportation to the lower river districts, indigenous trees from which to draw planting material are points decidedly in favor of the Amazon.

Unique Pigment Dispersion

A Colloidal Carbon Black for Latex Compounding

ONE of the major difficulties of rubber latex compounding has been that of incorporating carbon black. Nearly all other pigments may be mixed with rubber latex over a wide range of concentration without trouble. Carbon black, however, because of its enormous specific surface causes coagulation when added in any except very small proportions. Various protective colloids have been employed to aid this condition, but with development of B-1 Dye, a new principle of dispersion, the solution of this problem became possible.

This material is not actually a dye. It is the finest of rubber reenforcing carbon blacks dispersed in a new way and by means of a new dispersing agent. It dissolves spontaneously in water in all concentrations and can be mixed with rubber latex without danger of coagulation. The dispersing agent has been so selected and employed as not to disturb any of the physical properties of the latex rubber. The rate of cure and tensile and physical properties generally are improved through the presence of this dispersing agent.

Several very important advantages result from the use of this carbon black dispersion. These are: (1) protection against sunlight, (2) better spreading of proofing stock, (3) excellence in electro-deposition work, and (4) cleanliness of handling and mixing. These are considered below in the order named.

One of the chief advantages of carbon black compounding in all rubber goods, and more especially in latex articles, is its protective action against the actinic rays of sunlight. This becomes especially important in latex articles because these are, as a rule, very thin, so that the damaging effect of sunlight is particularly aggravating.

Many attempts have been made to substitute organic dyes as shields against sunlight, but experience has shown that this method has little or no value. The action of carbon black in absorbing all the light rays by means of refraction, diffraction, and internal reflection insures the protection of the sensitive latex film against sunlight.

Ease of spreading effect with latex is attainable for the first time by means of B-1 Dye. By its addition to rubber latex the viscosity can be raised to the point where the mixing spreads properly in standard proofing machinery. This ease of spreading coupled with lightproof properties opens up a new field for latex compounding. For example, camera bellows must be absolutely lightproof; also the film must be strong, tough, and flexible. These properties are best insured by the combination mentioned.

Carbon black when present in the form of this dye offers advantages in the anode rubber process. In choosing dispersing agents special attention must be paid to the electric charge on the particles of carbon black; and it will be found that when deposited by an electric current, the carbon black in this preparation has the same charge as that of the latex globule, also the speed of migration of the dye particles will be found sufficiently high to insure excellent results without further preliminary treatment of the black with protective colloids, etc.

Although not directly related to the compounding advantages, mention should be made of the ease of handling this dye. It is in wet form; therefore it can be unpacked, weighed out, mixed, and handled without danger of contamination due to flying of carbon black. Since so many of the latex products are of delicate color, this advantage is of obvious importance in any latex factory.

Speedier Automobiles

A Rubber Shock Insulated Bus Seat

REQUIRE MORE RUBBER *to* Curb Increasing Shocks

Automotive Engineering Specialists in Vibration Insulation Meeting New Vehicle and Transportation Needs—Shackling Devices, Engine Cushioning, Torque Insulators, and Shudder-Proofing Prove Very Effective

WITH manufacturers steadily increasing the potential speed of automobiles, and state, county, and city authorities yielding more and more to the urge for less restriction on swift travel and delivery, engineers in designing cars to afford higher speed find it necessary to use more and more rubber for absorbing the increasingly greater intensity of shock to which automobiles are being subjected. How this need is being met is told by Robert F. Cowell, engineer of rubber shock insulation, Mack Trucks, Inc., New York, N. Y.[1]

The fact is stressed that the automobile is more than a self-propelled vehicle. It is a "shock absorption" machine. Not only must it absorb all road shocks but also those due to harsh engagement of the clutch, sudden application of the brakes, and the vibration set up by the reciprocating and rotating parts of various units such as the engine and transmission. The latter may yield shocks of lower amplitude, but they are of higher frequency; this is more harmful to the other parts of the machine. Where only metallic supports or connections are provided for the units, all these destructive shocks are dispersed into the entire chassis and body, the cumulative effect being to shake the whole apart.

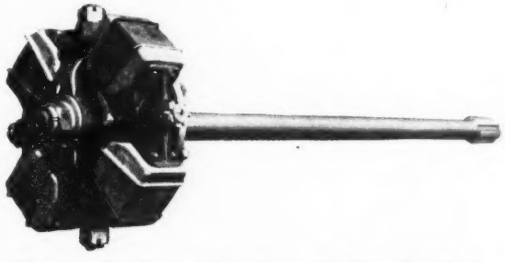
How Rubber Fitments Function

That rubber was not used until quite recently to insulate vibration between the component units of a motor-vehicle seems odd, since it has been known to have the ability to absorb about 50 times as much energy as steel on account of its inherent quality to withstand deformation and return to its original shape unaided. So well does it do this work that the energy it gives out on expansion is less than that absorbed during contraction. Any shock or vibration transferred to the rubber causes its molecular structure to become agitated. Its low internal-friction readily allows it to adjust itself to a "constantly varying flow of shocks" or to what is ordinarily termed vibration.

Thus far the most general use of rubber in car construction has been for shock insulation of the road springs through the shackles. The smaller road shocks are now quite well taken up by the larger tires with lower inflation pressure, but it is desirable to supplement such insulation with a suitable shock-absorbing device between the sprung and the unsprung weight of a car, as many blows will be transmitted through the frame unless cushioning be provided at these points. A sharp metallic pounding will, for instance, result from any loosenness, as where wear of a shackle pin allows slack in a bushing.

Shackle Insulator Unique

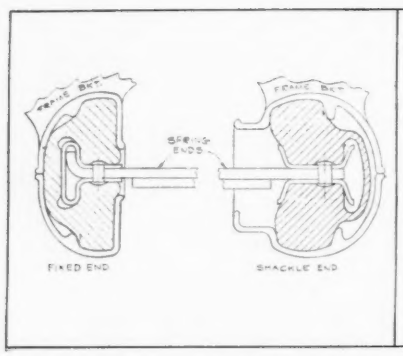
The shock insulator for spring shackles is unique inasmuch as it is a relatively large cushion of rubber, almost completely housed and set up with the correct initial displacement. It is made in one piece but has sections of rubber to cushion the spring end in all directions. An individual type of cushion is used for the fixed and for the shackle ends of the spring.



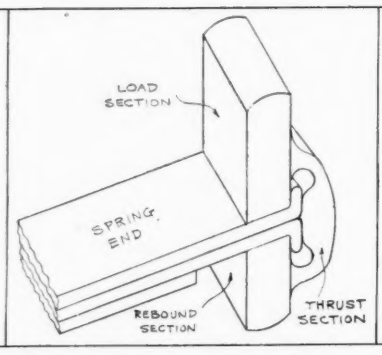
Torque Insulator with Four Rubber Cushions Assembled in Cups after Initial Displacement

While various rubber compounds are used, in the main they have a quality which has been found to stand up well in service. A typical stock, measured with Shore hardness-testing instruments, will register about 68 hard and 68 elastic. It will have a minimum tensile strength of 2,000 pounds per square inch, with an ultimate elongation of 450

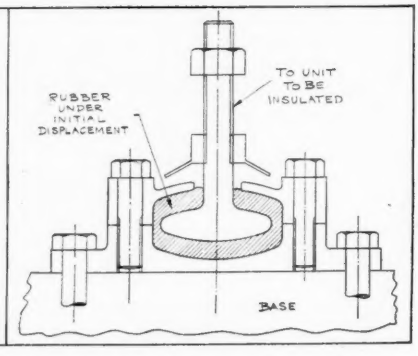
[1] Abstract of "Rubber Articulation for Shock Absorption," *S. A. E. Journal*, June, 1930, pp. 747-52.



Individual Type of Rubber Cushion Used for Fixed and Shackle Ends



Method of Proportioning Length to Width of the Rubber Cushion



Rubber Engine Supports for Automobiles or Industrial Machinery

per cent of its original length. Tests have shown that such rubber stock will take a permanent set when the constant load carried is more than some 150 pounds per square inch.

Easy Give Replaces Shock

In service it is found that when brakes are suddenly applied, the rubber is displaced, quickly at first, but with the rate decreasing as the blow is expended, allowing what would otherwise be a sharp shock to the entire mechanism of the chassis to become an easy "give." So, too, the forward thrust due to sudden engagement of the clutch is dissipated easily in the thrust-section of the rubber-cushioned block. In brief, the effect obtained is support between two or more cushions, as, for example, the upper load cushion above the spring leaf and the lower or rebound cushion.

A thrust cushion has been provided at the end of the spring to take up the propulsion of starting and driving, and is so set up as to allow only a certain amount of "give." On front wheels where shimmy, wheel fight, wabble, wandering, and like troubles are to be dealt with, such a section has proved valuable. While the housing of the unit is made less in height than the combined height of the load and rebound cushions and the spring leaf and bearing plates or cups, ample space is allowed for the rubber flow or bulge in a horizontal direction. Displacement may be also provided for by means of holes or grooves in the rubber.

How Engines Are Cushioned

A problem quite different from that in the spring shackle is found in cushioning an automobile engine, because the rubber fitment must be interposed between rigid arms and stiff side-frame members so that while the motor may be buoyed up, it will not float too much. Excessive movement of the engine is overcome by providing ribs on the supports which enter grooves in the rubber cushions. This divides the rubber into a number of small sections through which no great amount of movement can be obtained. In this way enough volume of rubber can be used to give the proper absorption. Tests have shown that while a little too much rubber is not detrimental to this design, less rubber may be used to damp effectively this high-frequency vibration of low amplitude.

Even though spring shackles and engine be well insulated, frame distortion can do much damage to other units of the chassis. To minimize injury in this way use is made of the engine-support design but with larger rubber cushions. They prevent the weaving of the frame from throwing great stresses into these units and can deaden any vibration. Good use can also be made of such shudder-proof insulation for the radiator, cab, gasoline tank, between the outriggers of the frame and the body of a motor-coach, for the torque arm, the distance rod, etc.

Torque Insulator's Benefits

A torque insulator contributes much to easy riding while it lengthens the life of a motor vehicle. It is a flexible-cushion connection which can be inserted in the driving line, such as between the clutch or transmission, and has four generously proportioned cushions of rubber assembled into cups after initial displacement and mounted on two arms, one driving, the other driven. While intended for straight-line drives, it can take care of much misalinement or universal-joint action, even permitting such joint to be dispensed with. A shock as that occasioned by sudden application of the clutch is easily absorbed in the rubber cushions because of the temporary distortion of the rubber, and the "flow of torque" being brought from small to large proportions (or reversed) smoothly and without damage to transmission gears or the shafts.

At the same time a torque insulator prevents vibration from passing from one unit to another, as from the engine to the transmission, and their harmful vibration in unison. A recent development is a torque insulator to be attached to rear wheels; but instead of having the rubber cushions held between stamped cups fastened to two arms, they are restrained between the ribs of two cast housings, one of which is bolted to the axle shaft and the other to the wheel hub. For passenger cars this application is not essential, but it has proved of much value on dump trucks working in excavations. Where drivers are constantly dropping the clutch quickly to rock a truck out of a rut, it has effected great saving to axle shafts and gears as well as the transmission and the engine.

Rubber in Panels and Seats

Vibration, squeaking, and drumming are quite overcome in closed bodies by snapping rubber moldings between the turned edges of the body sections and putting it under displacement by clamping. Mass production methods are speeded up by the use of rubber shock-insulation in bodies. Panels and stampings do not need to be so accurate as when welded or riveted construction is used. Bodies formed of separate panels can be held together tightly and yet be semi-flexible. Rubber shock-insulators are equally effective on bodies made with individual stampings or the all-metal stamped bodies with each side made from a single sheet. They give metal bodies the advantages of the Weymann body, without sacrificing rapid production.

Rubber shock-insulated bus seats are a comparatively new development. Not content with spiral springs in the usual cushion, designers have managed to take up vibration more completely with shock absorbers under initial displacement and set between seat frame and supporting metal pedestal. The rubber fitments are said to be very effective and to add much to the comfort of drivers and passengers.

Water Dispersions of Rubber

Conclusion of the article published in INDIA RUBBER WORLD, August 1, 1930

Use of Colloidal Clay

IN a recent U. S. Patent No. 1,755,891 Pratt disperses rubber using only colloidal clay. The colloidal clay may be worked dry, together with the other compounding materials such as sulphur, organic or inorganic accelerators, pigments, softeners, etc., into the rubber mass by a standard mill in which the smooth surfaced rolls are separated and are driven at different speeds; or a small quantity of water may be added to the clay so that it is compounded with the rubber while in a moistened state. After the clay has been compounded with the rubber, it is placed in a mixer similar to a dough mixer, wherein the mass is subjected to a stretching and pulling operation; meanwhile water gradually is added. As the water is mixed, the mass swells, and finally, a paste as smooth as butter results in which the rubber globules are dispersed in the aqueous medium. Water may be added until the mass is of the consistency of cream, and by the addition of more water it becomes of the consistency and general appearance of milk. In this condition acids such as acetic acid may be added without the coagulation or mechanical adhesion of the rubber globules.

In its paste form the mass may be spread with a spreading machine or painted on a surface with a brush or an air nozzle; and in any case, with the removal of water by evaporation, the rubber globules adhere and coalesce to form a continuous rubber film.

Ten to 15 per cent of certain colloidal clays may be employed in effecting the dispersion of such coagulated rubbers as "smoked sheet," "pale crepe," "upriver fine para," and the like in dispersing the rubber globules to a size and form similar to that in which they exist in the serum of the latex as drawn from the rubber tree. By way of example, 85 per cent of pale crepe may be compounded with 15 per cent of colloidal clay (bentonite or wilkenite) to which 10 per cent of water has been added, and then after the compounding operation has been completed, by introducing the mass into a mixer and gradually adding water during the mixing operation, a paste of the desired consistency is produced.

The colloidal clay may be used to supplant a part of the whiting, magnesia, or the like. Thus, for example, in dispersing a compound which would ordinarily consist of rubber 25 lbs., whiting 25 lbs., zinc oxide 15 lbs., litharge 10 lbs., barytes 10 lbs., mineral rubber 10 lbs., and sulphur 5 lbs., the whiting may be reduced to 23 lbs., and the barytes to 8 lbs.; by employing 7 lbs. of colloidal clay and compounding this with the rubber and water, and then adding the remainder of the compounding materials as noted, a dispersion is obtained by the gradual addition of water to the mixer during the mixing operation.

In this patent Pratt further amplifies his theory of dispersing rubber in water as follows:

"It is my belief that the rubber globule found in the latex consists of a terpene center with an organic protective colloidal film or coat, and that, on coagulation of the rubber globules, the colloidal coatings are dehydrated and adhere together. A deformation of the globules takes place, with the decrease in the surface tension of the globules and the increase of the areas of their interfacial contact, as the protective coatings become ineffective in maintaining the globules separate from each other. Doubtless this adhesion of the coatings and hence of the globules is assisted by the resinous or other substances which are present in the natural latex and which are more or less adhesive in character.

"Colloidal clay does not, in my opinion, form a coating or film for the globules of precisely the same character as that which initially protects the globules in the latex. It is inorganic and while it is lubricating in its nature when moistened, and performs the function in the rubber dispersion of maintaining the globules separate from each other and permitting freedom of movement, it differs from the natural coating of the globules in that, while the natural coatings are affected and are easily caused to coagulate by the addition of acids to the mass, the colloidal clay coatings are not thus affected."

¶ What takes place when a mass of rubber is dispersed in water?

¶ Water absorption is effected by mechanically kneading the rubber with a suitable water carrier like colloidal clay.

¶ This mechanical treatment consists of working the rubber in an internal mixing machine until the water and clay penetrate the mass and separate the rubber globules.

Abstracts

The following abstracts give a brief survey of the United States patents relating to the water dispersions of rubber.

1. Alexander, 821,394. May 22, 1906. Rubber is dissolved in benzene and then heated with caustic soda. The benzene is removed by passing steam into the solution, leaving an aqueous dispersion of rubber.

2. Alexander, 844,077. Feb. 12, 1907. Rubber is dissolved in benzene. This solution is treated with caustic soda. Steam is then passed through the solution to remove the benzene. The caustic soda is removed as a separate layer, leaving a viscous mass soluble in water.

3. Plauson, 1,432,895. Oct. 24, 1922. Process of reclaiming vulcanized rubber consists in intensively mechanically disintegrating it in the presence of water until a latex-like dispersion is obtained and removing the free sulphur from the rubber.

4. Kirschbraun, 1,498,387. June 17, 1924. An emulsion is made by mixing 20 per cent bentonite or colloidal clay, 80 per cent rubber, and 60 parts of water. The water and the bentonite are first mixed and next the rubber is added. The whole is then stirred and heated to 300 to 400° F.

5. Trumbull, 1,513,139. Oct. 28, 1924. An aqueous viscous paste of glue, casein, gluten, sodium resinate, or gum arabic is first prepared on a mill. To this, rubber softened by paracumarone is added slowly. Small amounts of peptizing agents such as sodium carbonate, sodium borate, and ammonium hydroxide may be added. The resultant viscous mass can be dispersed in water.

6. Pratt, 1,609,308. Dec. 7, 1926. Reclaimed rubber, asphalt, or wax tailings are mixed with a small amount of water until entirely absorbed. A suspension of colloidal clay in water is then added to the mass giving a water dispersion of the materials.

7. Pratt, 1,614,019. Jan. 11, 1927. An aqueous dispersion of rubber is formed containing in addition to rubber, sulphur, zinc oxide, red iron oxide, ethylidene aniline, and free soap. When this mass is vulcanized, a sponge rubber is produced having free soap distributed throughout, which can be used for toilet and washing purposes.

8. Pratt, 1,621,468. Mar. 15, 1927. The process of dispersing unvulcanized rubber in water comprises dissolving rubber in benzol, mixing the solution with water, in the presence of an extract of soap bark until the rubber is dispersed in the water, and removing the solvent.

9. Rose, 1,675,959. July 3, 1928. A process for making fibrous sheet material comprises beating a paper making fiber in water, adding an alkaline dispersion of rubber in water containing sodium resinate, mixing the suspension and the dispersion, slowly acidifying the mixture by the addition of alum solution, permitting the positively charged resinate thus formed to carry the dispersed rubber towards and onto the fiber, and subsequently forming into sheet material.

10. Trumbull, 1,708,111. Apr. 9, 1929. The method comprises preparing a hard, friable, thermoplastic derivative of rubber by the reaction with rubber of a sulphonic compound containing the grouping R—SO—X, in which R represents an organic radical or a hydroxy group and X represents a hydroxy group or chlorine, comminuting the rubber derivative, beating in water a fibrous material, intimately admixing in water the comminuted rubber derivative and beaten fiber, rough-forming and drying the admixed materials, and compacting the rough-formed material by the application of heat and pressure.

11. Pratt, 1,731,725. Oct. 15, 1929.

Crude rubber is worked on a rubber mill to warm it and increase its plasticity, and during this operation 7½ per cent (by weight) of wilkinite or colloidal clay moistened with water is added. At the same time also may be incorporated in the mass any suitable compounding materials in proper proportion, such as sulphur, vulcanization accelerators, pigments, or fillers, and the like. The rubber mass is now transferred to a two-bladed mixer in which it is slowly kneaded, stretched, and pulled while water is being delivered slowly and gradually into the mixer. After a short time a paste is produced with water as the continuous phase in which the rubber globules are of the order of those in latex as to size, form, and other characteristics, the other compounding materials, if present, being likewise dispersed.

When this operation is completed, add 0.5 to 2.0 per cent (proportional to the weight of the original colloid) of aluminum sulphate in solution, which is worked into the pasty mass. This has, at first, unless the salt is slowly added in a dilute solution, the appearance of thickening or coagulating the mass, but, on further kneading, the product smooths out and has the same spreading properties as had the paste prior to the addition of the electrolyte.

A film of the resulting product has physical characteristics, which are markedly different from those of a layer or film formed from the dispersed rubber prior to the addition of the salt. If crude rubber only were dispersed, the layer or film on being dried is soft, tacky, and coherent. The resultant product may now be spread or painted in a thin layer or film, which on drying is continuous, coherent, irreversible, and waterproof.

12. Pratt, 1,732,027. Oct. 15, 1929. A process of producing an aqueous dispersion of coagulated rubber comprises subjecting a coherent mass of rubber to a kneading and stretching operation in the presence of a dispersing agent while gradually adding water containing a lubricating agent thereto until a change of phase takes place and the rubber disperses as minute particles in the continuous aqueous medium.

13. Reel, 1,735,547. Nov. 12, 1929. The invention comprises preparing a dispersion containing rubber, water, and oil in the presence of an emulsifying agent which has a greater affinity for oil than for water. In one method of carrying out the process 100 parts by weight of water are emulsified in 15 parts by weight of spindle oil containing 5 parts of stearic acid. This emulsion may be formed by adding melted stearic acid to the oil and then stirring in the water, maintaining the temperature at say 130-150° F., to keep the stearic acid from solidifying. One hundred parts of pale crepe, preferably well masticated or softened on the mill, are now introduced into a mixer containing the emulsion, which is maintained at 150-200° F., and the mixing operation continued until a smooth uniform product is obtained in which the rubber is no longer visible in lumps.

If the dispersion is treated with sufficient alkali to combine with the stearic acid, the dispersion speedily reverses its type to form an oil in water type, where the water has now become the continuous phase leaving the rubber dispersed. This reversal of type is accompanied by a change in some of the properties and particularly the adhesive properties. Instead of being a sticky product, it has now become smooth, velvety, and resembling concentrated latex. If the amount of alkali be neutralized, that is if the stearic acid be liberated again as such or if the soluble stearate be converted into an insoluble stearate, the dispersion again reverses, and once more becomes the sticky water in oil type.

14. Kirschbraun, 1,738,509. Dec. 3, 1929. Rubber is fluxed with asphalt or coal tar pitch on calender rolls. Colloidal clay and water are added and heated to 180° F. This mixture is thinned with water and is mixed into paper pulp stock.

15. Trumbull, 1,744,844. Jan. 28, 1930. Rubber isomers are dispersed in water by masticating with casein, glue, gelatin, or colloidal clay and gradually adding water containing a peptizing agent.

16. Pratt, 1,755,890. Apr. 22, 1930. A process of emulsifying a vulcanizable crude rubber compound, comprising a mechanical mixture of crude rubber, sulphur, pigment, and an accelerator, comprises mixing and dissolving the soluble components of the mass in a volatile solvent, emulsifying the resulting product in water with a colloidal emulsifying agent, and removing the solvent and a portion of the emulsifying agent, leaving the components of the compound finely dispersed in the water.

17. Pratt, 1,755,891. Apr. 22, 1930. The process comprises manipulating below decomposing temperatures a coherent plastic mass of rubber in the presence of colloidal clay and gradually adding water while the mass is being manipulated until the rubber disperses as minute particles in the aqueous medium.

18. Pratt, 1,755,892. Apr. 22, 1930. The process of dispersing rubber comprises incorporating sea moss into a mass of rubber and manipulating the mass while gradually adding water until the rubber disperses in the water. Certain organic dispersing agents, such as glue or blood or bean albumin, may be united with an alkali such as caustic soda to produce stable, alkali-free compounds which may be successfully employed as additional dispersing and lubricating agents without injuriously affecting the colloid.

19. Pratt, 1,762,194. June 10, 1930. Casein and water are incorporated in rubber, the water is removed, and the mass stirred in a non-solvent consisting of resin, Montan wax, mineral rubber, and copal. A water-carrying colloid is introduced into the mass by kneading.

WINDOW DISPLAYS THAT SELL RUBBER GOODS

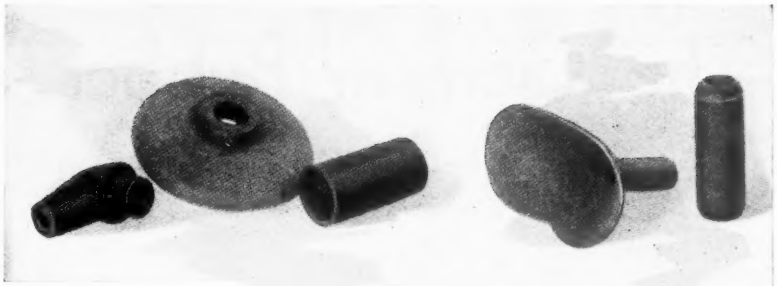
COMPTOIR COMMERCIAL DU CAOUTCHOUC, Brussels, Belgium, has gained a reputation for beautiful window displays that play a large part in selling its rubber products. The company, with twenty retail shops in Belgium, intends to develop a business in France as well as that which it enjoys in its native land. Already it has opened in Paris a wholesale department and three retail shops.

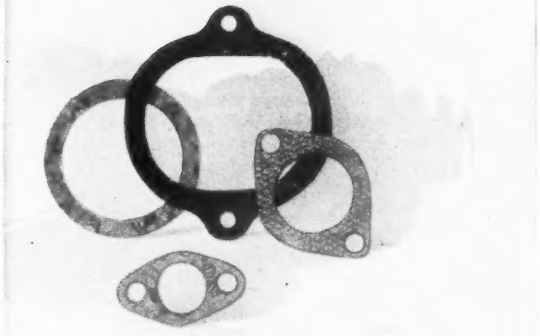
Upper Photo: Henri Manuel; Lower: Photo Chevojon

Two of these are shown in the accompanying illustration. The upper one is at 16 Boulevard de Strasbourg; while the lower, the new store at 37 Boulevard Haussmann, is one of the finest in the world. Its windows afford the passer-by a clear view into the interior of the shop besides showing a comprehensive and attractive array of a wide variety of rubber articles. The big show window reveals the basement store where corsets and elastic girdles are prominently placed. In this same window waterproofs appear on wax mannequins in motion. The attention of the spectator is caught also by the display on the first floor. In smaller windows on both sides of the entrance are seen rubber toys, sponges, hot water bottles, hygienic articles, etc. Inside the shop everything is exposed in showcases and counters of glass and nickeled bronze. All floors, stairways, and tables are covered with rubber tiling.

Another artistically designed store is in Brussels. An unusual feature here is that the windows, which offer a stunning exhibit of waterproof garments, are built on a slant along the corridor leading to the shop. Thus, a person entering can easily view the display in both windows and not merely in the one from the direction of which she has just come.

WHAT the USER of Mechanical Packings and Rubber and Asbestos Products SHOULD KNOW





R. J. HINKLE[1]

THE careful buyer who a few years ago gave little thought to the purchase of mechanical packings and rubber and asbestos goods now finds few questions more puzzling than that of the intelligent selection of such materials. Before the era of present-day high temperatures and pressures, packing problems were of little consequence; satisfactory results could be obtained from mediocre or even poor materials. That picture, however, has changed entirely; service conditions today demand that materials in this classification be scientifically constructed of the best asbestos, rubber, and other commodities entering into their manufacture. Anything short of the best will not suffice.

The buyer or the user of mechanical packings is confronted, therefore, with the question of determining which one of the many products offered to him really is the best. Some large users of asbestos and rubber materials have gone to great lengths and incurred considerable expense in an effort to arrive at definite conclusions in this direction. Frequently the outcome of such extensive chemical and physical tests is a packing specification prepared by the buyer in the hope that materials made for him to conform to that specification will end his packing troubles.

While it is true that the buyer who is so inclined and financially able to do so can assemble a great mass of data concerning the chemical and physical properties of various packing materials, in the final analysis that information is of little or no value to him. What he really wants to know is that he is receiving the maximum service for every packing dollar which he spends. The infinite details as to exactly how a product of this character is made or why it is made that way should not concern him. A logical course to pursue is:

First. Select a source of supply. In making this selection you naturally will turn to some reputable established manufacturer who specializes in such materials and whose products have a recognized standing in the industrial field.

Second. When this selection has been made put your problems squarely before that manufacturer. Let him survey your entire plant and equipment, and accept his recommendations as to size and kind of material for each application.

Third. Make sure that your equipment is in proper condition to operate. Worn and scored rods or plungers, rods that are out of line, flanges that are pitted, and equipment which has not been maintained properly should be taken care of.

Fourth. When this has been done, see that the packings are properly applied. Wrong application frequently is entirely responsible for poor packing service. If you are in doubt as to just how to apply such materials, call on the manufacturer; his representative will supervise and assist in doing that work.

Fifth. Make positive and suitable arrangements for lubrication of all rods, plungers, or shafts on which packings are employed. Without lubrication satisfactory service can not be obtained.

Sixth. Keep a record of the date of application and the date of removal of each installation. From this you can arrive at a definite cost and have something on which to base comparisons.

If at the end of a reasonable period—not less than six months and, preferably, a year or longer—you feel that your costs are excessive or that your present source of supply is not sufficiently diligent in looking after your interests, consult some other manufacturer. If a change is contemplated, however, the user should not be influenced too greatly by a comparison of the price per pound now being paid by him with the price per pound which may be quoted by another manufacturer; more often than not, low initial price means high final cost. So much for the packing problems of the maintenance man.

To the designer of new equipment or devices these problems are even of greater importance. If through lack of attention a piece of new equipment is built on which inadequate provisions for packing have been made, that equipment will always be a source of trouble to builder, operator, and company attempting to pack it.

The wise designer, therefore, will call upon the packing manufacturer in the early stages of design for suggestions as to the proper stuffing box proportions and packing materials. This will afford the manufacturer ample time to study your problem, to produce molds if necessary, and, if conditions warrant, to develop a special product for your specific use.

In summing up the situation it is evident that it is of more vital importance to the user to know something of the ideals, the reputation, and the standards of the company from which he purchases such products than it is to attempt to delve into the construction details of the product itself. Too frequently, "A little knowledge is a dangerous thing." If it is a packing problem, look to a company specializing in manufacturing packings for its solution.

[1] Advertising Manager, The Garlock Packing Co., Palmyra, N. Y.

The German Rubber Association

The Fourth General Meeting of the Deutsche Kautschuk Gesellschaft (German Rubber Society) Was Held at Frankfurt a. Main during June 15-16. In View of the Importance of the Papers Read at This Meeting, Abstracts of Sufficient Length to Give the Reader a Clear Idea of the Contents Will Be Published in These Columns, and the First of These Follow.

THE Constitution of Rubber According to Its Swelling in Liquids. By P. Bary, Paris. Among the numerous hypotheses which have become known regarding the constitution of rubber, the only one, which in the opinion of the author is capable of explaining in totality the known phenomena of this material, is the theory of variable polymerization. Variable polymerization is generally or always accompanied by a solution which is evidenced by the fixation of polar radicals at the free affinities of the molecular chains. The writer has demonstrated previously that by means of this theory many phenomena connected with vulcanization can be explained in connection with the swelling in fluids.

In the present work new results published by Stamberger concerning the vapor tension of gels are discussed. Bary cannot agree that Stamberger's conclusions are opposed to the theory. On the contrary Bary shows that his conception is the only one of the hypotheses known today by which it is possible to explain the cause of the difference in the swelling in solvents or in saturated vapor, both the second heat principle as well as the thermic phenomena accompanying the swelling being taken into consideration.

Finally the paper refers to a very sensitive method of measuring the contraction accompanying the swelling of rubber as well as data concerning some results which confirm communications previously published by various research workers in this field.

On the Molecular Weight of Rubber and the Nature of Its Colloidal Solution. By H. Staudinger, Freiburg. Up to the present neither the structure of the rubber particles nor the nature of the colloid solution of rubber has been made clear. Most research workers in this field have assumed that the colloid particles of rubber are micellae. See Pummerer, K. H. Meyer, and H. Mark. However, these scientists differed in their opinion of the size of the basic molecule which these micellae form. According to Pummerer it is a uniform basic molecule $(C_5H_8)_8$; according to K. H. Meyer and H. Mark it contains longer main valence chains.

In the author's opinion the primary colloid particles, that is the colloid particles present in dilute solutions, are identical with the molecules which, because of their particular size and lability, have been designated macromolecules. This hypothesis was proved by the production of polymerous homogolous products of decomposition and by chemical investigations like hydration. Particularly significant were the viscosity investigations at various temperatures and concentrations. These had to be carried out in the complete absence of oxygen. In this way it could be proved that macromolecules were in fact in solution and not micellae.

Viscosity investigations finally also led to the determination of the weight of the molecules, seeing that with hemi-colloidal products of decomposition, relations between specific viscosity and molecular weight result, in accordance with the following equation: $\frac{\eta sp}{c} = \text{Km. M}$

Furthermore, the relative viscosity varies with increasing concentration for the different products in accordance with definite laws. Thus the molecular weight can also be calculated from the viscosity concentration constants.

On the basis of these determinations the molecular weight of rubber is shown to be about 100,000, which agrees with earlier osmotic measurements, so that by this means the molecular weight and not the micella weight was determined. See W. A. Caspari and W. Ostwald.

The entirely different nature of the behavior of rubber solutions as compared to that of low molecular substances becomes clear when it is considered that the rubber molecules are comparable to long rigid threads.

The sphere of action of these molecules even in approximately one per cent solutions is greater than the available volume, and for this reason in the case of rubber we have to deal not with real solutions but gel-solutions. The peculiar behavior of rubber solutions, therefore, does not depend on micella formation but on the peculiar state of the solution. This explains the abnormal osmotic pressures and the swelling phenomena. The low molecular substances, in which the molecule has only a small field of action, do not present these abnormal phenomena. However, the low molecular and high molecular substances are continuously connected by transitions.

The Viscosity of Rubber Solutions. By C. M. Blow, London. On the basis of numerous experiments relating to viscosity measurements of high molecular substances, Staudinger recently offered the hypothesis that viscosity is to be regarded as a function of the molecular weight. In rubber solutions a very high degree of variability of the viscosity could be shown. Not only does the viscosity of solutions obtained from different crude rubber grades vary, but it also depends on the treatment of the rubber and many other factors.

Previously published results are recalled which relate to the viscosity of rubber solutions combined with gas black. These measurements led to the consideration that, in general, gas black effects an increase

Courtesy I. R. I.

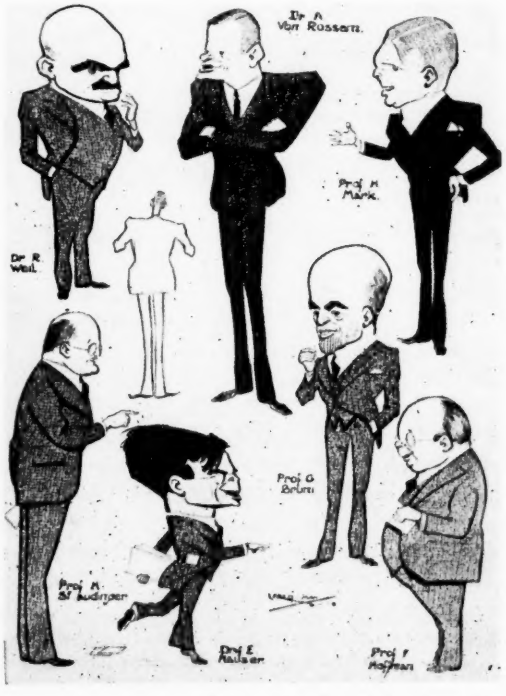
in the viscosity and a development of the elasticity of the structure. The fact itself was explained by the McBain theory, which assumes that rubber molecules adsorbed to the gas black particles become orientated and thus form a structural entity.

In the present work results are reported concerning the measurement of the viscosity of rubber which has been subjected to more or less prolonged milling. These results show that the viscosity increases with the storage period of the milled rubber. It could also be shown that not only oxygen but other factors have an important influence on the result. An attempt is made to formulate an explanation of the phenomena observed which will take into account all the factors.

Rubber Molecule or Rubber Micella. By H. Kroepelin, Erlangen. This question has become of increased theoretical importance since H. Staudinger has been attempting to find the molecular weights of high polymers on the basis of viscosity measurements. For this he assumes that only free molecules are present in dilute rubber solutions. This question is also of importance in explanations concerning the processes in mastication, to determine whether we have to deal with a modification of the size of the molecule or with a modification of colloidal nature. Viscosity measurements at different temperatures alone do not permit of a decision beyond this: that either we have to deal with molecules or with very stable micellae. Others have attempted to find the answer by measuring the heat of combustion of masticated rubber; however, sufficient precision in measuring is lacking, for with the large molecule the influence of any newly appearing final members is only trifling in amount. A decision can be brought about, by determining the thermic factor sizes of rubber solutions, like the swelling heat and the heat of dilution. By an indirect method, this can be determined down to concentrations of 0.4 per cent. It may be assumed that the variations found depend on differences in the micellar structure.

On the Viscosity of Rubber Solutions Under the Influence of Benzoyl-Superoxide. By G. Fromandi, Giessen. A contribution to the methods of determining the inorganic fillers, etc., in rubber mixes. When determining mineral fillers and certain inorganic fillers in rubber mixes by solution in paraffin oil or anisol, it is well known that difficulties are encountered in filtering when golden sulphuret of antimony is present. These necessitate the use of a centrifuge since the relatively high viscosity of the resultant colloid system does not permit sedimentation at a rate of speed satisfying practical requirements. Some serial investigation into golden sulphuret of antimony mixes, in which, due to external causes, the use of a centrifuge had to be omitted, made it necessary to devise a method which excluded centrifugation. With the aid of decalin (deca-hydronaphthaline) and benzoyl-superoxide it was found possible to let the usual solution take place in such manner that sedimentation of the filler or golden sulphuret of antimony particles was considerably accelerated and filtration was no longer a matter of difficulty.

In connection with this experiment, the action of benzoyl-superoxide on rubber solutions was studied viscosimetrically. In the presence of benzoyl-superoxide, one per cent solutions of purified first latex crepe showed a considerable lowering of their viscosity, a decline which is accelerated by light and higher temperatures and which is primarily due to an oxidative decomposition, much rather than to depolymerization in a narrower sense. It is in connection with this that the property of benzoyl-superoxide to cause vulcanization effects in rubber in the absence of sulphur, is examined from the point of view of an oxidation theory and discussed.



Courtesy Ger. Soc. Rubber Chem.-Eng.

Rubber as a Working Material in Electrical Engineering. By H. Heering, Cologne. The electrical qualities of an insulated material may be characterized by the four principal properties as follows: (1) The insulation resistance, (2) the dielectrical constants, (3) the efficiency factor, (4) the resistance to penetration.

Rubber has such a high electrical resistance that for most practical purposes it may be considered a non-conductor. The absorption of sulphur during vulcanization improves the insulating power of the rubber and, what is more important with regard to electrical values, its resistance to penetration of moisture is increased. The effect of fillers in rubber mixes also depends to a great extent on their behavior in the presence of water. Lamp black, added in small quantities, has only a slightly deteriorating effect on the insulating properties of rubber but, if added in larger quantities, deterioration progresses rapidly.

The dielectric constant is of great practical importance particularly for low current cables, the capacity of which depends upon the size of the dielectric constants of the insulation. For high current purposes the dielectric constant is important because of its effect on the distribution of the electrical field.

The processes which take place in a dielectricum under the influence of a powerful electrical field affecting both the dielectric constant and the efficiency factor, may be explained by Debye's theory, according to which the electrical field working from the outside exercises a deforming effect on the fields of power of the molecule. The dielectric constant is influenced by this inner tension.

In alternating current the direction and the size of the electrical field change constantly, causing a corresponding deformation of the molecule, a work which is converted into heat because of the internal friction of the material and results in the alternating current losses known as the efficiency factor.

If the intensity of the electrical field exceeds a certain value characteristic for each dielectricum and the so called penetration intensity is reached, the dielectricum will fail and as a result a sudden collapse of the electrical field follows accompanied by local mechanical destruction of the insulating material. The resistance to penetration is of the greatest importance for security in the exploitation of high current installations, and accurate determinations of these material constants are difficult.

By imbedding the electrodes in a semi-conducting fluid part of the difficulties in the way can be removed. In the present experiments a castor-oil-alcohol solution was employed.

Penetration tests were carried out with sheets of 1 mm. thickness made of the following materials:

1. Smoked sheets.
2. Pale crepe.
3. Mixing of 100 parts smoked sheet, 10 parts zinc white, 3 parts stearic acid, 3 parts sulphur, 1 part mercapto-benzothiazol.
   a. Unvulcanized sheet.
   b. Vulcanized under the press.
   c. Vulcanized in steam.
   d. Vulcanized in hot air.
4. Basic mixing No. 3 plus 30 parts American gas black.
5. Basic mixing No. 3 plus 30 parts German rubber black.
6. Basic mixing No. 3 plus 30 parts inactive black.

(To be continued.)

Cement for Temporary Use

A cement for temporarily attaching various materials is made of degraded crêpe rubber 12, gasoline or like solvent 87½, and resin (colophony) ½ per cent, according to U. S. Patent No. 1,752,557, April 1, 1930.

EDITORIALS

Oil Companies Selling Tires

NOT surprising to those closely following trade trends is the announcement that one of the major oil companies will sell automobile tires at all its service stations, as some of its subsidiary concerns have been known to be conducting experiments in such direction for several months. Evidently the results have been encouraging enough to warrant widespread extension of such merchandising. It has been well understood, too, that the cost of marketing oil and gasoline through overexpanded, elaborate retail outlets has been so heavy that soonor or later some suitable sidelines with a quick turnover and yielding a fair profit would have to be taken on by even some of the larger oil companies to lighten the load, if not to add to income.

In taking to tire selling it is intimated by the oil company that it contemplates neither price war nor any letdown in quality, and it is specifically stated that it will not engage in the making of tires. Profiting by the experience of great mail order concerns, it will avoid the risk, trouble, and expense of maintaining any factory, obtaining all its goods from established tire making concerns. While it is planning to help itself, the oil company may claim that it, and such others as are likely soon to follow its lead, may also help some tire manufacturers by relieving the latter of the burden of maintaining costly distributing organizations. A disquieting feature, however, is competition with independent dealers and with some manufacturers who have costly chains of service stations.

If tire selling be successful, doubtless batteries, brakelining, and other accessories may be added. In fact, it is even possible that filling stations may yet become miniature department stores.

* * *

Giving All Workers a Chance

A PLAN whereby all workers will have a chance to earn if not full pay for full time at least proportionate pay for part time is being tried out by leading rubber manufacturing concerns in Akron, Ohio, as a measure of employe relief until business again approximates normalcy. Thus, when a slowing down of trade conditions requires a reduction in production, instead of certain classes of operatives being thrown out of work wholesale, as it were, and they and the community suffering keenly from sudden stoppage of wages and from indeterminate idleness, the blow will be "cushioned" by having a factory's entire force bear evenly the thrust of a let-down. Under that plan an employe may thus be out of work but one week in eight, or to such extent as the volume of orders may warrant.

To complement such arrangement a production policy may be pursued, which, instead of aiming to drive the works and workers at top speed at certain periods, will aim so to equalize operations that jobs will be steadier and work better distributed throughout the year. Thus would peaks and valleys be ironed out, feasts and famines made less likely, a better feeling engendered, and wasteful labor turnover reduced to a minimum.

Such a stabilization scheme is rational and humane. It is designed to apply the most logical cure for unemployment, the absorption of the idle into the mass of workers through a process of rotation; and while one week off in eight might work out well, there is reason to believe that an extra day off a week might effect even a better distribution of benefits during a dull season.

* * *

Overhead and Lower Costs

A PUZZLED rubber manufacturer asks: "How should overhead be proportioned to sales volume to keep it from cutting too sharply into narrowing profits?" Even though more exacting business conditions and customers' requirements tend to increase overhead, this necessary evil can be kept in check. It is not so much the size of the overhead that counts but whether it is kept in balance with the total business done. Thus a small manufacturer whose overhead expense is light and who works compactly at 80 per cent capacity may compete with a large concern operating at 35 per cent but burdened with a heavy overhead on widespread units. Neither direct labor nor dollar sales can indicate the proper proportion of overhead expense, which justifies itself only to the degree that it actually lowers unit cost.

* * *

How Productivity Has Mounted

A STUDY of man-hour productivity made among eleven major industries by the Bureau of Labor Statistics, United States Department of Commerce, reveals the fact that the rubber tire industry tops the list for output on such basis. As compared with 1914, the man-hour productivity in the tire line showed an increase in 1927 of 292 per cent. In contrast with this, the automobile industry, the efficiency of which is generally regarded as unexampled, showed the lower though very creditable gain of 178 per cent for the same period.

The rubber survey covered the three main divisions of tire production: pneumatic automobile, motorcycle, and bicycle tires; inner tubes; and solid tires. The showing is certainly flattering to the tire industry, and credit for the great advance made can be quite evenly allotted among the progressive producers and their able allies, the enterprising machinery makers and the purveyors of new and staple fabrics and chemicals.

What the Rubber Chemists Are Doing

A. C. S. Rubber Division Meetings

THE American Chemical Society will hold its fall meeting at Cincinnati, O., September 8-12. Two half-day sessions of the Rubber Division are scheduled for September 10 and 11 at the University of Cincinnati in Burnet Woods Park. The program of the division comprises twelve papers, the abstracts of which are printed below. The usual divisional banquet will be held on Wednesday evening, September 10, at Hotel Gibson.

Notes on the Carbon Black Flame. The basic difference between carbon black and lamp black is defined in terms of the method of collection. Possible causes of the unique properties of impingement black are discussed. By reference to two types of carbon black flames, viz., round and flat, the conception of "combustion quotient" (s/v) is developed and applied to variations in flame size and shape and to drafting. The position of the impingement surface, the effect of flame shape, of gas flow, and of position of channel are briefly discussed in relation to the quality and quantity of black obtained. Factors of importance in large-scale operations are mentioned. W. B. Wiegand.

Behavior of Antioxidants in Rubber Stocks Containing Copper. Deterioration accelerated by copper in a high-grade tread stock, a low-grade tread stock, a high zinc oxide bus tube stock, and a pure gum stock has been found to be retarded effectively by the use of suitable antioxidants. Secondary aromatic amines have been found to be much more effective than other antioxidants in tread stocks for retarding deterioration due to copper. The degree of protection afforded to rubber compounds containing copper by the use of certain antioxidants, notably secondary aromatic amines, is sufficiently high to make their addition of practical importance.

Previous experiments in certain stocks with phenyl beta-naphthylamine have brought out the fact that increasing the concentration of antioxidant beyond about 1 per cent produces relatively small increases in age-resisting properties. It is suggested that Bailey's theory of chemical inhibition may apply to the behavior of rubber antioxidants since the same type of activity-antioxidant curves are obtained for rubber mixes as were obtained by Bailey for the reactions which he studied. The effect of copper may be explained as due to an increase of active interface or to an increase in activity of interface normally present. In order to measure the relative degrees of protection against oxidation conferred by various age resisters on rubber mixes, it is suggested that copper compounds be added. This should be of valuable assistance in segregating the oxidation factor of aging since oxidation is thereby greatly accelerated. P. C. Jones and David Craig.

Water Absorption of Rubber Compounds. The water absorption of a vulcanized rubber compound is of considerable importance in evaluating a rubber compound. In this study it has been shown that fillers such as whiting, barytes, clays, zinc oxide, thermatomic carbon, and carbon black have different effects on the water absorption. Thermatomic carbon gives the lowest water absorption. Volume loading apparently has very little effect. Water absorption of vulcanized rubber decreases with increased time of cure, reaching a minimum at the optimum cure, after which it increases again perceptibly.

Rubber under stretch absorbs water faster than at rest. A tread compound which has been immersed in water and subsequently dried gives higher physical tests than the original compound. The presence of metallic acetates in a vulcanized rubber compound causes an increase in the water absorption. A hard rubber compound absorbs water in much the same manner as a soft rubber compound but decreases rapidly as the optimum cure is reached. Reclaimed rubbers vary considerably in water absorption, those having greatest amount of residual alkali present giving the highest water absorption. Shoe reclaim has lowest water absorption. H. A. Winkelmann and E. G. Croakman.

Hard Spots in Vulcanized Rubber Compounds. The cause of local variations in the hardness of experimental slabs of carbon black tread stock at different points on the same slab has been investigated. It has been found that areas of excessive hardness correspond to regions where the maximum flow or displacement occurred in the rubber when the stock was compressed into the mold at the time of cure. It has been shown that this cannot be attributed to non-uniform regions produced by localized flow in the rubber-pigment-sulphur mixture. It is concluded that the variations in hardness must be due either to altered conditions of dispersion in the regions of maximum displacement or to a local grain effect set up by the flow. Experiments are described which suggest that the hardness cannot be explained satisfactorily on the basis of dispersion, but the author does not regard this evidence as conclusive. J. H. Howey.

Modified Balance for Approximate and Quick Weighing. A spring is added to an ordinary beam balance so that approximate overweight and underweight (in terms of grams, length, or volume) may be indicated on the first deflection. The time required to make a weighing is also greatly reduced. Such modified balances are especially adapted for checking and adjusting the weight of an article during or after processing under conditions of mass production. E. Karrer.

New Autographic Rubber Testing Machine. A description is given of a testing machine for the measurement of the tensile strength of materials having considerable deformation, such as rubber. A stress-strain recording device is described in which the strain recorded responds to the separation between a pair of independently movable pointers which may be made to follow the separation of two marks, spaced upon the sample before insertion in the machine. Mechanical means are also described to correct variations in the test piece cross-section and to equalize the angular displacement of the pendulum to the displacement of the chart. George J. Albertoni.

Graphical Tensile Tester for Rubber Threads. A sensitive and accurate device of the direct curve drawing type has been evolved from a standard tensile machine for testing rubber threads such as those used in making elastic fabrics. Details of construction and use of the machine are described. A representative graph drawn by the machine, showing its ability to duplicate curves of similar samples is reproduced. A comparison between this machine test and the standard dumb-bell test is made. S. H. Hahn and E. O. Dieterich.

Kelly Abrasion Machine. An abrasion machine is described with which it is possible to obtain results on tire treads more nearly in accordance with the results of road wear. The machine is so designed as to simulate the wiping action in a portion of a tire tread under a load which first gradually increases then decreases. Data are given showing the probable accuracy of the machine and the small range occupied by results for a given stock as compared to that obtained on another machine. Data are given also showing what may be expected of this machine when results obtained thereon are compared with road test results on the same stocks. Contemplated improvements in

the machine to obtain a still greater degree of accuracy are pointed out. A. F. Hardman, W. S. MacKinnon, and S. M. Jones.

Determination of Alkalinity of Reclaimed Rubber. A new method is given for determining the relative alkalinity of reclaimed rubber. The extraction of the alkaline material is based on a digestion of the sample in a mixture of ethanol, benzene, and water. The method is compared to the previous method described by the authors in 1928. The experimental figures given show that the new method gives results which are dependable and approximately four times as accurate as the previous method. The higher degree of accuracy is due to the elimination of much of the personal error, the extraction of a larger percentage of alkaline material, and a more accurate titration end point. Henry F. Palmer and George W. Miller.

Reenforcing Action of Pigment Mixtures on Rubber Compounds. The data presented in this paper show that mixtures of varying ratios of either channel black or a soft carbon black with whiting, lithopone, or clay show additive physical properties. Mixtures of soft carbon with zinc oxide also show additive properties; while mixtures of channel black and zinc oxide show poorer resistance to abrasion, higher modulus, and higher tensile strength than would be shown by purely additive mixtures. The explanation of these results appears to be found in the chemical reaction between the basic zinc oxide and the acidic compounds in the rubber or on the black. These results have been applied to the formulation of a solid tire stock which will give a better resistance to abrasion and blow-out when using a soft black than when using a channel black. D. J. Beaver and J. W. MacKay.

Effect of Increasing Gas Black Loading on Flex Fatigue Resistance as Determined on the Goodyear Flexing Machine. Details of a hitherto unpublished test for determining flex resistance are given. Data have been obtained with this test on a series of comparably cured stocks of various gas black loadings from 18 to 30 vol. per 100 vol. of rubber. The effect of three different accelerators as well as two different antioxidants is shown. Abrasion tests on the Grasselli and Akron Standard machines are included. The decreased flex resistance and consequent tendency to tread cracking is demonstrated, and the effect of certain antioxidants in improving this resistance is shown. A. M. Finley.

Determination of the pH of Ammonia Latex by (I) a Colorimetric Method, (II) the Glass Electrode. The pH of latex has been determined at various concentrations of ammonia by the use of (1) indicators and (2) by the application of the glass electrode. The two curves thus obtained were comparable but not identical. It is shown that the glass electrode gives results reproducible with a high degree of accuracy up to pH 9.5 and a fair degree of accuracy up to pH 11.0. Above pH 11.0 it is necessary to calibrate each electrode. An ordinary galvanometer allowed measurements of the E. M. F. to 1. millivolt. The asymmetry of the glass was so small as to be negligible. J. McGavack and J. S. Rumbold.

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Technical Communications

Testing Micronex

THIS company in its laboratories has regularly measured the loss in weight when Micronex samples were raised to a high temperature. Exhaustive studies designed to elucidate the significance of the volatile content of carbon black and its relation to quality have been made. These studies have yielded results of prime importance, which indeed have already resulted in new products.

In the course of these studies the relation between volatile content and rubber quality was incidentally but exhaustively investigated. Coefficients of correlation have been established, the net conclusion being that, while volatile matter may sometimes serve as a guide, it is not foolproof. Very frequently it tells the wrong story regarding quality. The volatile test, although regularly employed as a secondary guide, has therefore never been adopted as the primary control in the test for Micronex carbon black.

Carbon blacks have a strong affinity for most organic accelerators and will remove them, for example, from alcoholic solutions. The percentage of accelerators thus removed or adsorbed is also an indication of an important property of all carbon blacks. Our laboratories have regularly measured this property and it is at the present time a daily feature of control testing. However, like the volatile test, its coefficient of correlation is not high enough to justify its adoption as the primary control test for Micronex.

From the above it will be seen why rubber testing has from the beginning been the standard for Micronex control. Rubber tests cost many times more than chemical tests such as volatile or adsorption tests. However, the greatest impediment to the universal employment of rubber control testing was the difficulty of sampling and the time factor. Within the past year both of these difficulties have been solved, since field laboratories have been installed and the sampling of Micronex has been rendered foolproof by a special mechanical device designed by this company's engineers, which automatically insures that all test samples of Micronex are representative in the strictest scientific sense. Data from Binney & Smith Co., 41 E. 42nd St., New York, N. Y.

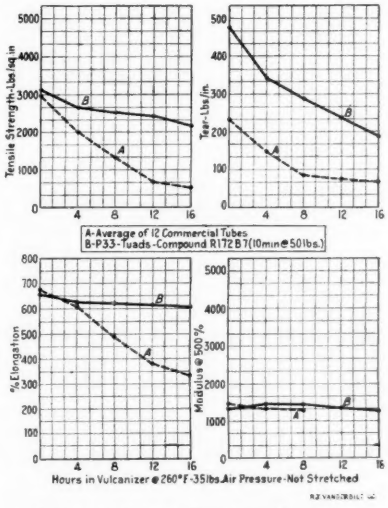
Rub-Er-Red Oxide

RUB-ER-RED, a new red oxide for rubber compounding, sets a new high standard of tinting strength. It is acid and alkali free, contains no soluble salts, while its manganese and copper content are below any known rubber compounding ingredient specification. Added to these points of excellence are freedom from grit, extreme fineness, soft texture, stability, and inertness. The material is uniform in all its characteristics and disperses readily, producing a clean bright colored stock. Data from C. K. Williams & Co., Easton, Pa.

Heat Aging of Bus-Truck Tubes

A SPECIAL heat resisting compound for bus and truck inner tubes has been developed, which by laboratory tests shows far superior aging quality than the average results obtained on 12 high-grade commercial bus-truck tubes. The tests included specific gravity, stress-strain, tensile, and elongation, original, after aging in bomb 96 hours, at 70° C, with oxygen at 300 pounds' pressure, and the same after air exposure in the vulcanizer at 260° F. In the last test the samples were not stretched.

Comparisons were made of resistance to tear at 82° F., by the Winkelmann method on original samples and after the bomb and hot air agings mentioned. Finally the permanent sets were compared by stretching the samples 50 per cent after heating in the vulcanizer. The superior


Tensile Strength-Lbs/sq in
Tear-Lbs/in
% Elongation
Modulus @ 500%
A-Average of 12 Commercial Tubes
B-P33-Tuads-Compound R172 B7 (10 min @ 50 lbs.)
Hours in Vulcanizer @ 260°F-35 lbs. Air Pressure-Not Stretched

Heat Aging of Bus-Truck Tubes

quality of the new stock was pronounced as indicated in each of these tests.

The formula for the above stock, R172 B7 compound, together with results of laboratory press cures, is in the following tables:

Ribbed smoked sheet rubber	100
Zinc oxide	5
Carbon black P-33	40
Stearic acid	1.5
AgeRite powder	2
Tuads accelerator	2

Cured at 50 Lbs.' Steam Minutes	500 Per Cent	Tensile	Elongation
5	845	3690	800
7	890	3640	775
9	915	3590	770
12	945	3570	765
15	965	3560	760

Modulus, tensile, and elongation figures obtained on press-cured slabs naturally do not duplicate exactly the corresponding figures obtained on an actual inner tube. Data from the R. T. Vanderbilt Co., New York, N. Y.

Aging of Compounds Containing Rosin

THE adverse effect of rosin on the aging properties of compounds that contain it is well known to all rubber chemists. The following compounds were used to determine how effective Neozone D might be in offsetting the tendency of rosin to accelerate oxidation.

	Compound Numbers			
Ingredients	748-1	748-2	748-3	748-4
Smoked sheets	100	100	100	100
Zinc oxide	10	10	10	10
Rosin	..	..	5	5
DOTG	1	1	1	1
Neozone D	..	1	..	1
Sulphur	3	3	3	3

Rosin retarded the cure of the compounds in which it was used to such an extent that the best cure was 60 minutes at 267° F. The compounds which contained no rosin were correctly cured in 25 minutes at 287° F. Aging tests were conducted in the air oven at 70° C. and in the oxygen bomb at 70° C. and under 300 pounds per square inch pressure of oxygen.

The oxygen bomb tests clearly show that rosin accelerates oxidation and that Neozone D retards it. The compound containing both rosin and Neozone D aged much better than the compound containing neither Neozone D nor rosin, but not so well as the compound that contained Neozone D but no rosin. Both of the stocks that contained no antioxidant were so badly deteriorated at the end of four days that they could not be tested.

The oven aging test is not, strictly speaking, an oxidation test. Little difference exists between the aging of Compound 748-1 and Compound 748-2 because Neozone D has no value as a heat resister and oxidation plays a relatively small part in this test. Compound 748-3 containing rosin aged considerably poorer than Compound 748-1, the control. Compound 784-4, which contained both Neozone D and rosin, aged fully as well as the control compound.

Summarizing, the oven tests indicate that 1 per cent of Neozone D is sufficient to counteract the effect of 5 per cent of rosin. The oxygen bomb tests show that 5 per cent of rosin greatly increases the tendency of this stock to oxidize and that the addition of 1 per cent of Neozone D is much more than sufficient to offset the effect of 5 per cent of rosin. Data from Rubber Laboratory Report No. 146, E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.

Crimson Oxide of Iron

THE brand of oxide of iron known as Smith's No. 444 Rubber Crimson is characterized by brightness of color, exceptional tinting power, uniformity, and fineness. It analyzes in excess of 99 per cent of sesquioxide of iron, is free from acid or alkali, and its moisture content is negligible. No grit or harmful impurities are present, and in fineness more than 99 per cent of the material passes 325 mesh. Data from The Roessler & Hasslacher Co., Inc., 10 E. 40th St., New York, N. Y.

Hand Roller Replaced by Pneumatic Tool

The familiar hand rubber roller has been developed into a vibratory pneumatic tool. Its specific use is thoroughly to compact calendered sheet stock against a metallic surface as in applying a rubber lining to a tank.[1] For this service the apparatus comprises a roller *A*, in Figure 1, mounted on a rod *B* with a handle *C*, the rod being stepped down at *D* to form a projection which fits into a pneumatic hammer. In a modified form for electrical operation, rollers *A*, *A* in Figure 2 mounted on a flat spring *B*, *B* are vibrated by spindles *C*, *C* on armatures *D*, *D* of solenoids *E*, *E*. The effectiveness of this tool is due to its power operation.

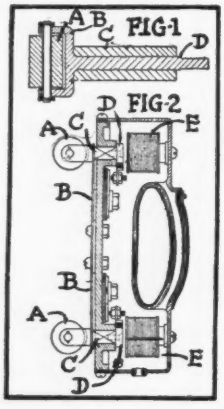


Fig. 1. Pneumatic Tool Roller

Fig. 2. Electrically Mounted Roller

The intensive rapid vibration thus imparted to the roller serves to effect close union of the rubber to the prepared metal surface and to eliminate thoroughly any air, the presence of which would impair continuous contact of rubber with metal.

[1] British Patent No. 327,856, June 5, 1930.

Norwegian Footwear Industry

Two manufacturers of rubber footwear are in Norway, the A/S Den Norske Galosche & Gummivarefabrik, Mjondalen, and the A/S Askim Gummivarefabrik, of Askim. The A/S Den Norske Galosche-& Gummivarefabrik is the older of the two companies, although the A/S Askim Gummivarefabrik is the more important concern. The latter company is a continuation of the Viking Fabrikker of Heggedal, which was destroyed by fire some years ago.

Since the establishment of the A/S Askim Gummivarefabrik in 1919, the production of rubber footwear in Norway has undergone a remarkable development. At present there are on the payroll of the company more than 1,000, which number is to be increased shortly to 1,250 workmen. Moreover, it is expected that the daily capacity of the plant will be in excess of 12,500 pairs of overshoes, as soon as the contemplated enlargement of the factory has taken place. The rubber footwear manufactured by the A/S Askim Gummivarefabrik is sold under the trade mark Viking.

Letters from Our Readers

Truth About Rubber Pavements

To the Editor:

Dear Sir: An article by A. S. Still in India Rubber World, July 1, 1930, p. 89, reflects the same farsightedness as the following quotation from a pamphlet written by Colonel Maurone, of London, in 1826, when the city had a population of one and one-half million: "Florence, Sienna, Milan, and other Italian cities have pavements with especially prepared wheel tracks. These tracks are three feet in width, made of large and particularly well laid stones. They are about four feet apart, and the space between paved with smaller stones." He further states that these pavements as well as those of Rome are the best that he has ever seen, but that they would be far too expensive for London.

Today granite blocks, with a 6-inch concrete base, are in use in nearly all cities that have good pavements. This pavement is installed in New York, N. Y., for $6 per yard minus the concrete base. Heavy iron truck wheels chip the granite blocks unless the surface is heavily pitched, showing more of an asphaltic surface than granite blocks. In hot weather the pitch becomes soft and sticks to the vehicle wheels and pedestrians' shoes.

Mr. Still says: "There is a far better chance of getting universal pneumatics by heavily taxing vehicles using any other kind of tire than there is of getting rubber roads, and if all the vehicles ran on really good pneumatics, all the available supplies of rubber would be required to shod them."

Such taxation would be unconstitutional in the United States. Besides, what will become of all the horses which have increased in numbers since the World War? Are they to be soft shod, perhaps balloon shod? Are we living in the primitive days, knowing nothing outside of our own range of vision?

Rubber pavement that has been down for many years in England has worn but ⅛-inch, and where repairs are necessary, the traction wave has dislodged the blocks. A newly invented means of installation aims to prevent the traction wave. The quality of rubber used in paving blocks in the United States is of low-grade reclaim at approximately four cents per pound. Rubber is not affected by water, ice, and with certain compounds very little by the sun. Sharp shod horses will not make indentations in the blocks if sufficiently compressed.

Rubber pavement on all city streets is only a dream of a person having little foresight. The only practical spaces which could be expected to be covered with rubber would be around hospital zones, bridges, industrial plants, railroad stations, loading platforms, ferry boats, and gangways.

Rubber pavement is not subject to expansion and contraction such as concrete and granite blocks. Wood blocks cannot be relaid like granite blocks, and a heavy rain ending with sleet and heavy frost causes damage that requires new blocks. The cost of rubber pavement is greater than granite blocks, but the upkeep is less.

Allan Williams.

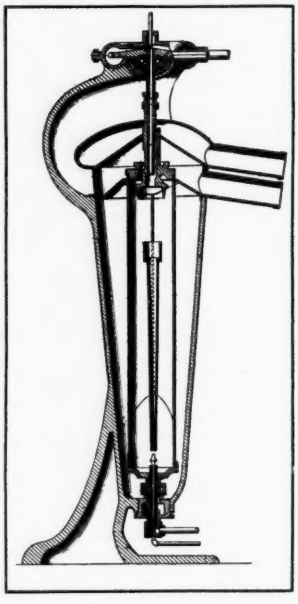
August 15, 1930.

Purifying and Concentrating Latex

There is much interest in patents relating to rubber latex because of the progress made in the practical manufacturing applications of latex and rubber dispersion. One of the newest patents[1] relates to latex purifying and concentrating by which the latex is first treated to remove the coarse cream material by centrifugal action.

This action is limited to just that required to concentrate the cream without material concentration of normal latex particles. Also the normal latex is displaced in and removed from the cream concentrate. The latter is washed with a solution adopted to accelerate later concentration of the cream-free fraction.

Hemoglobin may be used as a protective colloid to accelerate separation in the machine into serum and concentrated latex without producing coagulation. However, the best separating agent so far found that does not depend on hydrogen ion concentration is Irish moss sol.



Latex Separator

Other colloidal bodies analagous to the latter material are pectin, gum arabic, gum tragacanth, etc. A suitable machine for conducting the operations mentioned is here pictured. It is a centrifugal cream separator with modifications.

[1] U. S. Patent No. 1,754,535, Apr. 15, 1930.

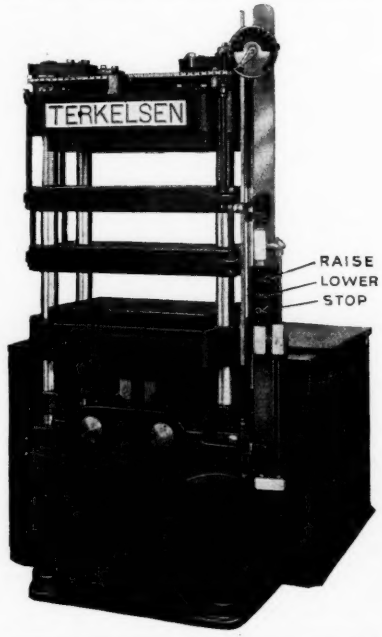
Gum-Shoeing Detectives' Horses

The horses of the mounted branch of Scotland Yard, London, England, are being shod with rubber shoes experimentally.

New Machines and Appliances

Electro-Draulic Press

THE nucleus of this strictly mechanical unit is the well-known rack and pinion power-driven arbor press equipped with mechanical and electrical means for con-



Terkelsen Molding Press

trolling the length of stroke and the amount of pressure applied to the work. It is particularly adapted for use by manufacturers of mechanical rubber goods, who employ single or multiple deck presses. Where hydraulic equipment is now used, this press may be readily installed and operated independently of that system as it is a complete molding unit in itself.

Its source of power is an electric motor operating through a train of gears to a rack pressed into the lower bed. The motion of this bed brings into action four specially constructed powerful springs located at the bottom of the press, acting as an accumulator maintaining the pressure and following up the contraction of the material in the curing process.

While the springs are maintaining the pressure during the curing period, the motor is not being used to deliver power. The purpose of the motor is simply to close the press and open it. The spring construction eliminates tilting of the platens and assures perfect distribution of pressure over their entire area and wide variation of the pressure applied to the work. This pressure is indicated on a dial mounted at the front of the press.

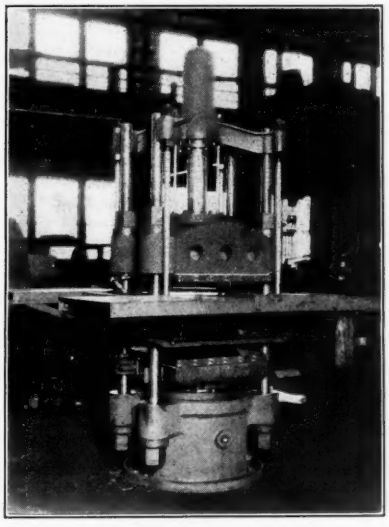
Raising, lowering, and stopping the press is regulated by push buttons. When the "Raise" button is pushed, the press starts and the rack continues in motion until the required pressure is reached when the press stops automatically. If necessary, the operator may stop or reverse at will the direction of motion during the opening or closing stroke.

The top and the bottom platens of the press are not cored for steam, but to them are attached properly insulated steam platens. This type of press is built in varying capacities, platen sizes, and number of daylight openings. Terkelsen Machine Co., 326 A St., Boston, Mass.

Hydraulic Press and Tables

THE press here pictured is an excellent example of modern hydraulic press construction for curing molded mechanical rubber goods. It is built entirely of steel except the ram, which is made of chilled iron ground and polished.

The curing plates are of rolled steel drilled for circulation of water and steam



Adamson Vulcanizing Press

for heating and cooling purposes and are insulated from the body of the press by heavy asbestos sheets. The press is designed for a working pressure of 2,000 pounds per square inch on 23-inch rams and has a travel sufficient to close all openings without any molds in them.

The hydraulic lifting arrangement is unique in that one cylinder lifts both tables, the lifting ram being held rigidly to the top plate of the press while the cylinder travels. This arrangement keeps the press down to a reasonable and convenient overall height. The tables are made of steel and are guided on the stress rods themselves, thus simplifying the construction and keeping the weight down to the least possible minimum. The tables are of sufficient length to permit loading and unloading the molds without removal from the table and each table is provided with conveyer rollers, the more readily to withdraw the molds from the press.

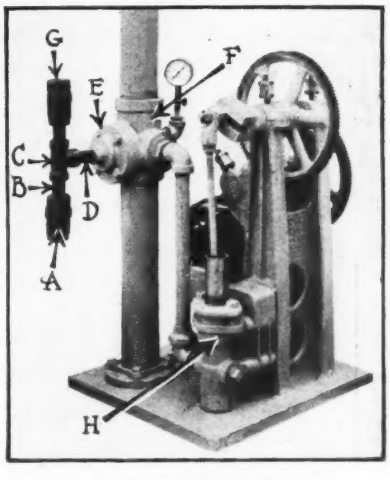
The object of the double tables is that each unit is entirely self-contained. Two men can operate five presses with this table arrangement as efficiently as they could two presses. The Adamson Machine Co., Akron, O.

Non-Corrosive Acid Pump

THE acid pump of special design, here illustrated, was designed to supply the need for a small capacity pumping equipment to handle an acid coagulant commercially. Besides resistance to acid the requirements included that the pump be capable of adjustment to pump a fixed amount per hour, and the desired amount per hour was five gallons. Pumps like the one pictured have been in continuous day and night service for months without failure.

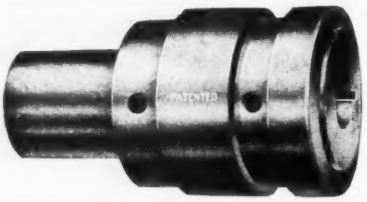
The pump will handle any acid not injurious to rubber, which means practically any acid except concentrated sulphuric. The acid comes in contact with rubber only, and the rubber parts are not subject to abrasive wear of any kind and should they become injured they are cheaply and quickly replaced.

The acid handling features of the pump are described as follows:



Rubber Acid Pump

The course of the acid follows through the lower check valve *A*, which is made of hard rubber with a special soft rubber check. This lower or inlet check valve is screwed on to a hard rubber nipple *B*, a



Johnson Single Clutch

tee *C*, and another nipple *D* going through the flange *E*, secured by four bolts to the main casting *F*. On the inside of *F* and turned downward is another nipple, elbow, and nipple, all of hard rubber. To the latter nipple is attached a pure gum rubber sack made of ordinary pure gum rubber tubing closed by a hard rubber plug at its lower end. The outlet check valve *G* is attached above the inlet as shown in the illustration.

Pumping action is secured by alternate pressure and suction impulses applied to water confined around the rubber sack by an ordinary piston pump *H* driven by a motor and gears. Leakage of water at the piston is compensated for by a special device located in the top of the chamber containing the rubber sack, which eliminates air and replaces it with water. A water reservoir above this requires filling about once every two days.

This is believed to be the only plunger type pump produced today in which the acid comes in contact with nothing but rubber. As far as known it is, also, the only acid pump which does not have packing glands to be kept tight. It is, therefore, dripless, of moderate first cost, extremely low maintenance cost, adjustable, and self-priming. The rubber fittings will withstand a pressure of 125 pounds. Paige & Jones Chemical Co., Inc., Hammond, Ind.

Improved Friction Clutch

THE well-known and universally adaptable Johnson friction clutch is extensively used in machinery employed in the rubber and many other lines of industry. Certain very important improvements are now embodied in its construction, the most recent of which is the replacement of tool steel adjusting blocks with chrome steel. These small parts are highly essential to the life of the clutch. The elimination of breakage from fire cracks in the hardening of these blocks through the use of chrome nickel steel blocks practically makes this super-clutch troubleproof.

An additional improvement in this friction clutch is the alemite one point high pressure system of lubrication, which forces grease to the interior and continuously lubricates all parts thoroughly. The Carlyle Johnson Machine Co., Manchester, Conn.

Rotary Hose Coupling

THE greatly increased depths to which oil wells are being drilled now as compared to the practice of a year or two ago have necessitated the use of high pressure pumps and heavier accessory equipment. These conditions have caused cooperative effort on the part of manufacturers of rotary hose and couplings to withstand the enormously greater working pressures.

The "Boss" rotary coupling here shown, when originally designed, was called upon to withstand a test pressure of 3,500 pounds. Rubber manufacturers have developed hose for double that pressure. This changed condition has been met in the recently improved form of coupling represented.

In comparison to its original design the coupling illustrated now stands test pressures as high as 7,000 pounds per square inch in the 2½-inch size, which is the regular size used in rotary drilling. The entire coupling is now heavier, and its stems have been improved to withstand the abrasion by mud and sand and will now give three times the length of service in that regard than those of the original design. Dixon Valve & Coupling Co., Philadelphia, Pa.

Take-Up Reel Driving Mechanism

THE accompanying illustration pictures a fully automatic take-up reel driving mechanism that removes the personal factor from the control of the speed of reels or conveyer belts.

Three devices are concerned in the combination pictured. These are the automatic control indicated by, *1*, the reel driving rollers, *2*, on which the flanges of the reel rest, and the automatic driving unit, *3*,

"Boss" Tri-Duplex Rotary Coupling

which drives the reel rollers by the sprocket chain *4*.

Yardage material to be reeled first encounters the roller *1* of the automatic controller and by its passage depresses the roller hinged at *5*, thus actuating a hydraulic system not pictured, which is piped from point *5* to point *6* on the driving unit.

Variations in the hydraulic pressure regulate the contact of two friction disks, thus automatically controlling the speed that the motor imparts to the chain *4* operating the reel driving rollers *2*. H. Monroe Smith, Passaic, N. J.

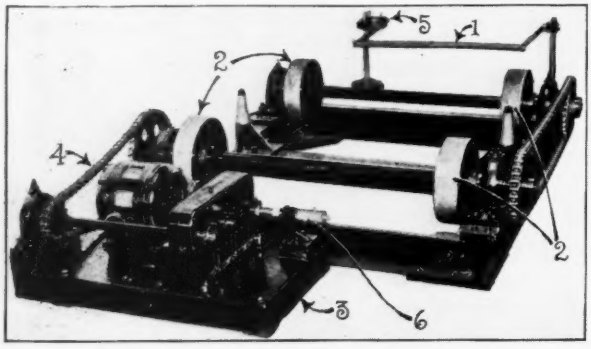
Bench Type Dial Micrometer

THE dial micrometer here pictured is designed as a bench indicating gage for wire although it may conceivably be useful for gaging sheet rubber. The dial is graduated to read 0.0001-inch.

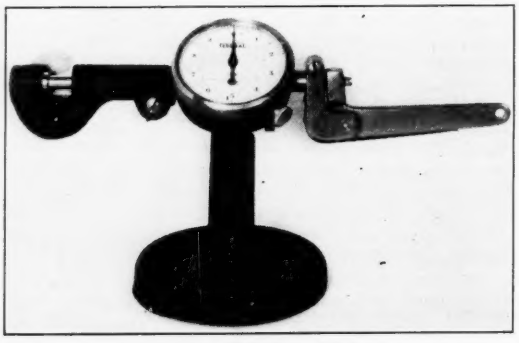
This gage is equipped with a lever arrangement operated either by hand or foot. In the latter case a wire or a cord is attached to the outer end of the lever and extended down through the bench to a foot-pedal.

In operation the inspector pulls the lever down to open the anvils. He then draws the wire through and take readings at any desired point. Each numeral on the dial represents 0.001-inch. The indicator can be swiveled on the bracket to bring the face toward the operator regardless of his position when taking readings.

The small metal piece seen at the back of the anvils is a guide which insures that the wire drawn through the gage will always be in the center of the anvils. The frame and anvil-carrying block are finished in black, while all other parts are chromium-plated. If used for gaging sheet stock of any kind, the small metal guide piece mentioned above would be removed to allow free entrance for the material being measured. Federal Products Corp., Providence, R. I.



Smith Automatic Reel Driving Mechanism



Federal Wire or Sheet Rubber Gage

Financial News

Continental Shares, Inc.

Continental Shares, Inc., investment company sponsored by Cyrus S. Eaton-Otis & Co., on August 14 reported net profit of $15,680,570 from the sale of securities during the six-month period ended June 30, 1930.

Continental Shares' portfolio shows holdings in The Goodyear Tire & Rubber Co. were increased to 96,800 shares from 75,800 reported on December 31, 1929, and holdings of Goodyear Shares, Inc., were increased to 582 shares from 277. Holdings in the United States Rubber Co. were increased to 70,300 from 35,000 shares. Holdings in the Firestone Tire & Rubber Co. were reduced to 29,750 from 107,800, and holdings for Goodrich common were reduced to 20,100 from 40,100 shares.

Increased holdings by Continental Shares in Goodyear and U. S. Rubber Co. strengthened the belief that the much-discussed merger between the two companies was a step nearer realization. Purchases in Goodyear were made, it was generally believed prior to its annual meeting and at the time when Cyrus Eaton obtained control of the company through holdings in his investment companies and private purchases.

United States Rubber Co.

To the Stockholders: During the six months ended June 30, 1930, net sales, after all discounts and allowances, amounted to $75,206,983. Sales for the first six months of last year were $86,073,346. The dollar value of sales of practically all commodities was lower, in many instances being affected by lower unit prices. Sales of tires and other rubber products to automobile manufacturers, due to the curtailment of their production, were materially lower.

After all charges including interest on funded indebtedness of $2,904,299 and provision for depreciation of plants of $3,730,793, the net decrease in surplus account amounted to $2,797,403. The provision for depreciation is an increase of $563,356 over the sum provided for the same period last year.

The current financial position of the company at June 30, 1930, was:

Cash		$6,948,849
Proceeds of issue of 3 year 6 per cent notes due June 1, 1933, deposited with trustee of 7½ per cent note issue due August 1, 1930		15,000,000
Accounts and notes receivable, less provision for doubtful accounts		32,432,604
Finished goods	$46,735,046	
Materials and supplies	19,864,581	
Crude rubber in transit to New York	1,811,293	68,410,920
Total Current Assets		$122,792,373
Bank loan of a subsidiary company	$2,000,000	
Export acceptances payable	3,000,000	
Accounts payable, including acceptances payable for importation of crude rubber	13,795,034	
7½ per cent secured gold notes due August 1, 1930, less $293,000 held in treasury	17,843,000	
Total Current Liabilities		36,638,034
Net Current Assets		$86,154,339

Plantations, after all charges and reserves, had a loss approximating $350,000. These results have not been included in the statement of the United States Rubber Co. Through the issue of $15,000,000 of 3 year 6 per cent secured notes due June 1, 1933, provision was made for the retirement of the 7½ per cent secured notes which matured on August 1, 1930.

Funded indebtedness amounting to $2,983,000 was retired during the six months.

A large number of small properties and three factories have been sold, and arrangements have been made for the closing of five additional plants in accordance with the plans to concentrate the manufacturing operations of the company.

F. B. Davis, Jr., Chairman.

August 6, 1930.

General Tire & Rubber Co.

During the first six months of the present fiscal year, the General Tire & Rubber Co. cleared enough profit to meet regular dividend requirements on both common and preferred stock for the entire year. General stockholders are therefore assured of the regular payments of $6 a share on the company's preferred stock and 16 per cent on the common stock.

During the first six months of the present fiscal year, the company produced and sold more General tires than during the same period in 1929. However, before the reduced prices at which tires are selling this year, the volume of business, in dollars and cents, during the first six months of 1930 was 11½ per cent below that of last year.

The next quarterly payment of dividend on preferred stock is due on September 30 to stockholders of record as of September 20, action on which will be taken at a meeting of company stockholders early in September. General's preferred stock has a par value of $100.

The company paid its regular quarterly dividend of $1 a share on the common stock of July 31 to stockholders of record as of July 21. The next quarterly dividend on common stock is due on November 30 to stockholders of record as of November 20, action on which is expected to be taken by directors early in that month.

At no time since the organization of the General Tire & Rubber Co. has the company failed to pay in cash regular dividends on both classes of its stock. This is a record that is held by no other large rubber company in the industry.

Goodyear Tire and Rubber Co.

To the Stockholders: Consolidated net sales of The Goodyear Tire & Rubber Co. for the six months ended June 30, 1930, were $110,804,582 as compared to $136,747,841 for the first six months of 1929. Unit tire sales, although not so high as in either half of last year, exceed those of any other six months' period in the history of the company.

Total net profits credited to earned surplus for the six months' period amounted to $5,592,309 after providing depreciation of $6,381,250, after taxes, interest and discount and after deducting profits of subsidiary companies applicable to stocks not held by the company. This is equivalent (after regular dividends on first preferred stock) to $2.02 per share for the six months' period on the common stock.

Inventories of raw materials and commitments for future deliveries of raw materials are written down to the lower of cost or market at June 30 out of current earnings, the reserve of $5,000,000 provided in previous years against raw material declines remaining intact. Inventories of finished product are carried at the cost thereof without writing down the rubber and cotton content, as it is expected inventories of finished product will be liquidated during the present quarter without loss.

The company's current position is favorable, there being no indebtedness to banks and the ratio of current assets to current liabilities 7.6 to 1.

The general world-wide depression in business has affected your company in common with most industries, resulting in lower net sales and net earnings, partly due to lower unit volume and partly to lower selling prices. However, it is anticipated results for the full year will be reasonably satisfactory.

P. W. Litchfield, President.

August 11, 1930.

The B. F. Goodrich Co.

The results of the operations of The B. F. Goodrich Co. for the six months ended June 30, 1930, were announced, following the regular quarterly meeting of the board of directors on August 6.

The consolidated net sales of the company for the first six months of 1930, including two subsidiaries acquired during the past year, amounted to $78,000,000, compared to $75,375,000 for the same period of 1929.

Operations for the second quarter showed a profit of $509,966 and for the six months' period a loss of $875,180, after all charges including interest and depreciation but before writing down inventory to market as of June 30, 1930. After writing down crude rubber and cotton to the lower of cost or market but taking supplies, semi-finished, and finished goods at cost in ac-

Advertising Abroad

Many rubber manufacturers, eager to press sales abroad, are deterred from extending business into foreign fields because of misgivings about modes of exploitation. To create consumer demand, which is even more important than distributer demand, goods must be freely advertised; but unless this is done expertly, there is danger of much loss even in the most promising areas. Unless a manufacturer knows such fields intimately and can gage quite well the relative merits of foreign publications, an authority advises that the safer course is to have the overseas advertising placed in a trade journal with broad foreign circulation.

cordance with the usual practice of the company, the results for the first six months showed a loss of $1,292,908. During the six months' period the company has not drawn on its reserve previously created for loss on raw material commitments, but on the other hand has increased it by $470,000 to a total of $1,800,000.

The current position of the company is very satisfactory, net current assets amounting to $84,222,306, being substantially in excess of the total funded debt of the company.

The regular quarterly dividend of $1.75 on the preferred stock of the company was declared payable on October 1, 1930, to holders of record September 10, 1930.

With a view to conserving the present strong liquid position of the company, the directors determined to omit payment of the current quarterly dividend on the common stock.

The company has suffered from the prevalent depression in business and particularly from the decline in raw material prices. The volume of business in lines other than tires has been fairly satisfactory. Sales for the second quarter fell short of expectations, but the month of July shows a substantial increase in volume over sales in preceding months.

Seiberling Issues $4,000,000, 6 Per Cent Debentures

Frank A. Seiberling, president of The Seiberling Rubber Co., Akron, O., on August 8 announced the issuance of $4,000,000, 6 per cent debentures, maturing at periods extending over three and one-half years. Of these bonds $3,100,000 already have been sold, entirely clearing all bank indebtedness of the company, it was stated. Debentures totaling $900,000 remain in the treasury for future use as required.

In making this announcement Mr. Seiberling revealed that July sales of his organization were 24 per cent ahead of June. "Although Seiberling sales for the first half of 1930 have run somewhat lower than during the same period of the preceding year, as has been the case throughout the industry," he declared, "the substantial July increase indicates a distinct turn upward in tire buying."

In 1929, Mr. Seiberling pointed out, Seiberling sales in June and July were substantially equal. The present increase was due in part, it was believed, to the popular acceptance of its new tires announced on July 1, enabling Seiberling dealers to compete directly in quality and price with mail order houses and chain stores. During July more than 400 new dealers contracted for the Seiberling representation.

The Seiberling plant in Akron is working three shifts, twenty-four hours a day, six days a week, to meet orders, it was stated.

Fisk Rubber

The Fisk Rubber Co., Chicopee Falls, Mass., reports a net loss for the half year of $2,651,822 after write-down of crude material depreciation, interest, and reserves for commitments. This compares with a net loss of $236,713 in the first half of the preceding year.

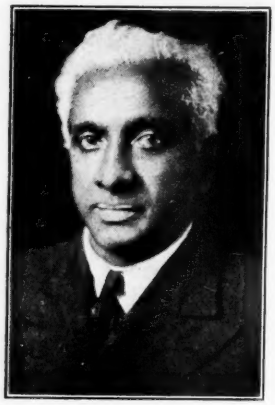
GARLOCK PACKING CO. SIX MONTHS ended June 30. Net profit after interest, Federal taxes, and other charges, $300,330, equal to $1.49 on the capital stock, compared with $414,538 or $2.07 a share last year.

THERMOID COMPANY, SIX MONTHS ENDED June 30: Net earnings after interest, taxes and depreciation, $283,294, equal to 77 cents a share on the common stock, compared with $464,850 or $1.38 a share last year.

Selenium in the Rubber Industry

The annual production of selenium in the United States amounts to approximately 425,000 pounds. Of this 100,000 pounds is consumed in the rubber industry chiefly in wire insulation for special vulcanizing effect in the presence of organic accelerators of vulcanization, and 200,000 pounds finds use in the glass industry for the production of red glass for signal and other purposes.

In the latter connection selenium is prohibited by specification in red glass for railway and marine signal lights. The reason is that selenium red exhibits a greenish effect which may lead to confusion of the signal when seen under strain due to overfatigue on the part of the observer.



Kaiden-Keystone Studios

C. E. A. Dias

A Scientific Planter

C. E. A. Dias, prominent Ceylon rubber planter, is visiting the United States as a guest of the United States Department of Agriculture prior to being officially received at the International Horticultural Congress of the Imperial Horticultural Conference held in Toronto, Canada.

Mr. Dias is one of the most advanced and enterprising of the Ceylonese estate owners and the first to introduce bud-grafting in Ceylon, being well known for his work on the prevention of soil erosion. He has been designated by the British Government as a Justice of Peace for the entire island, an unusual honor in the British Colonies.

Among the budded clones on the Dias estates are several which rank in the first class as descendants of the high producers originally imported into Ceylon from Brazil. Budwood and budded stumps from these clones are exported to Java, Sumatra, Cochin China, South India, and Malaya.

New Incorporations

B. F. GOODRICH FOOTWEAR CORP. (O.), 1,000 shares par value $100. Principal office, 27-33 W. 60th St., New York, N. Y. Distribute rubber footwear.

PARA MFG. CO., Aug. 14 (N. J.), $100,000. Principal office, 341 Halsey St., Newark, N. J. Manufacture rubberized shower curtains.

PENN ELASTIC CO., July 25 (Del.), capital stock 10,000 shares no par value. J. T. Hitchen, H. H. Snow, and C. S. Peabbles, all of Wilmington, Del. Manufacture, buy, sell, import, export, and generally deal in rubber and rubber products, particularly knitted elastic goods and fabrics of all kinds.

Dividends Declared

Company	Stock	Rate	Payable	Stock of Record
American Hard Rubber Co.	Com.	$1.00 q.	Aug. 15	July 31
Baldwin Rubber Co	Cl. A	$0.37½ q.	Sept. 30	Sept. 20
Boston Woven Hose & Rubber Co.	Com.	$1.50 q.	Sept. 15	Aug. 30
Firestone Tire & Rubber Co.	6% Cum. Pfd. A	$1.50 q.	Sept. 1	Aug. 15
B. F. Goodrich Co.	Pfd.	$1.75 q.	Oct. 1	Sept. 10
Goodyear Tire & Rubber Co.	Com.	$1.25 q.	Nov. 1	Oct. 1
Goodyear Tire & Rubber Co.	Pfd.	$1.75 q.	Oct. 1	Sept. 1
I. B. Kleinert Rubber Co.	Com.	$0.40 q.	Sept. 2	Aug. 19
Raybestos-Manhattan, Inc.	Com.	$0.65 q.	Sept. 15	Aug. 30
Thermoid Company	Pfd.	$1.75 q.	Aug. 1	.....

Editor's Book Table

Book Reviews

"Rubber Information. An Industrial and Commercial Compendium." Edited by H. B. Cronshaw. Leonard Hill, Ltd., Thanet House, 231-32 Strand, London W. C. 2., England. 1930. Cloth, 237 pages, 8½ by 10¾ inches.

This book is virtually a directory of the British rubber industry. Its scope is indicated in its full subtitle, which reads, "A Compendium of the Rubber Industry in all its branches, including Plantation and Factory Practice, Rubber Chemistry and Engineering, Trade Statistics, Machinery and Equipment, Rubber Chemicals and Materials, Planters and Manufacturers, Rubber Goods and Trade Marks."

In the compilation of the material contained in the volume the editor was assisted by a group of six well-known British rubber chemists and technologists, thus insuring the accuracy of the scientific data presented. The arrangement of the book is very convenient for reference, and no pains have been spared to embody in the text numerous references to recent articles on the chemistry and technology of rubber and current manufacturing practice as regards both methods and materials.

The work is to be published annually and thus will be kept abreast of new developments and record the latest information on all topics covered by the industry.

"Technical Dictionary for Readers of Foreign Technical Periodicals." By Hubert Hermanns, 114 Williamstrasse, Berlin S. W. 48, Germany. Second edition. Paper, 411 pages, 4⅜ by 6⅛ inches. Price $3.75.

This volume is a dictionary in three sections, embracing common equivalent technical terms. The arrangement is: Part I, German, English, Italian; Part II, English, German, Italian; Part III, Italian, German, English. The words and expressions listed exceed 8,000 and were gathered from 600 technical periodicals from all parts of the world.

This dictionary, as claimed by the author, will help one to overcome difficulties encountered in reading technical articles in any of these languages foreign to him. The terms listed relate chiefly to metallurgy, mechanical engineering, machine shop, and foundry practice.

"Official American Textile Directory." Bragdon, Lord & Nagle Division, McGraw-Hill Catalog and Directory Co., Inc. 1930. Office Edition. Cloth, 1,170 pages, 6 by 9 inches. Thumb indexed. Price $6.00.

Combined in this publication are the American Directory of the Knitting Trade containing all the textile manufacturing and knitting establishments in the United States, Canada, and Mexico, together with the Yarn Trade Index and lists of concerns in lines of business selling to or buying from textile mills.

The book is divided into the following: (1) General information on the textile trade and industry; (2) Raw Materials; (3) Yarns and Spinners, classified according to yarns spun; (4) Bleaching, Dyeing, Printing, and Finishing; (5) Commission Spinning, Winding, Weaving, Etc.; (6) Manufactured Goods; (7) Knit Goods; (8) Selling Agents, Commission Houses, and Factors.

New Publications

"Antioxidant Comparisons." Laboratory Report 148. E. I. du Pont de Nemours & Co., Inc., Wilmington, Del. This report is devoted to comparison of various antioxidants with respect to their effect on the rate of sun checking at 10 per cent elongation and natural outdoor aging under no tension. The primary purpose of these tests was to determine the effect of the following antioxidants on the rate of sun checking of a high grade tread compound: Neozone A, C, and D, Antox, Parazone, and Stabilite.

In order to determine whether the accelerator used had an influence on the effectiveness of any of these antioxidants in preventing sun checking, the entire series of antioxidants was tested in three tread compounds, which were the same except for the accelerator. The accelerators used were DuPont 808, diortho-tolyl-guanidine, and mercaptobenzothiazole.

"'U. S.' Rubber Gloves." United States Rubber Co., Sundries Department, Providence, R. I. An illustrated 28-page booklet with special U. S. filing cover. Contains illustrated descriptions of various U. S. acid aprons, gloves, mittens, lineman's blankets, sleeves, and gloves, surgeons' and household gloves, and latex gloves, mittens, and finger cots.

"The Davol Dealer," Vol. 3, No. 4, August, 1930. Davol Rubber Co., Providence, R. I. This 16-page house organ issued monthly contains brief articles on merchandising and other items of interest to dealers of druggists' rubber sundries, emphasizing, of course, Davol products.

"The History of the Revertex Process." The Revertex Corp. of America, 40 Rector St., New York, N. Y. An 8-page bulletin in which E. A. Hauser reviews the method of gathering rubber latex, discusses the colloidal-chemical properties of ammonia preserved latex, and outlines the methods employed in producing Revertex, the semi-solid evaporated form of latex that is capable of dilution to any desired degree for the impregnation of fabrics and other rubber manufacturing purposes.

"The Micronex Review—1930." No. 18 in the series known as "Chats on the Black Art of Rubber Compounding." The Binney & Smith Co., New York, N. Y. This booklet discusses the most recent developments in rubber makers' carbon black and throws new light on the phenomenon of adsorption activity, telling why Micronex is rubber tested so that this property may be controlled. There is a brief recital of the company's laboratory experience with rapid chemical methods of evaluating carbon blacks.

The story of Ultramicronex development is included, also the use of the new Micronex W-5 in wire insulation is covered in some detail. New recommendations based on service experience are also to be found.

Special reference is made to the 50 per cent Micronex ratio in tire tread compounding, and definite recommendations are advanced regarding tread stock formulation and handling. Three years have elapsed since Binney & Smith technologists first presented the 50 per cent Micronex idea to the industry, and the interim developments have now demonstrated the soundness of the theory.

"Facts on Factice." The Stamford Rubber Supply Co., Stamford, Conn. This booklet contains much interesting and valuable information concerning factice, its origin, history, preparation, properties, uses, and value of brown and white factice in the manufacture of rubber goods. Reference is also made to special grades which can be made to meet specifications.

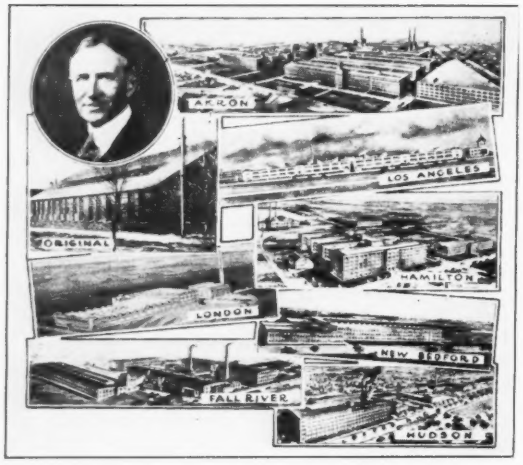
"Ace Hard Rubber Protection for Chemical Process Industries." The American Hard Rubber Co., 11 Mercer St., New York, N. Y., in this finely illustrated catalog of 54 pages describes its enlarged line of hard rubber chemical equipment designed for protection against the great majority of corrosive solutions. This equipment includes tank linings, power and hand pumps of various types and capacities, miscellaneous special equipment in great variety, also sheets, rods, tubes, and rubber lined pipe fittings.

"U. S." Filing Cover

The United States Rubber Co., 1790 Broadway, New York, N. Y., has made special covers for its catalogs for convenience in filing them. To do this the outside cover, which extends 13/16-inch above the pages of the booklet, is left open, for on the margin at the top of the left-hand inside cover is printed the subject matter of the catalog while the right-hand margin bears the name of the rubber company. The material used in this cover is known as Lexide, another U. S. Rubber product. Lexide is an extremely tough, durable stock, permitting folding without cracking, and is furnished plain or coated in a variety of colors.

Hail Firestone Firm on Thirtieth Anniversary

Founder and Aides Receive Numerous Congratulations on Amazing Progress Within Three Decades — High Lights in History of Great Enterprise



Firestone and the Industries He Founded

LEADERS of many industries in various parts of the world on August 3 extended to Harvey S. Firestone, Sr., and the executives of the famous tire and rubber company over which Mr. Firestone has been the guiding spirit since he established it thirty years ago, their heartiest congratulations on the remarkable success which it has achieved and their earnest wishes for still greater prosperity.

The occasion was quietly celebrated at the main plant in Akron, the only notable feature being the call made on Monday, August 4, on the head of the company by a little group of gray-haired veterans in the factory management. Nearly all had been with Mr. Firestone since he modestly launched his venture in 1900, and the chief and his loyal associates passed a pleasant hour recalling interesting experiences, especially concerning the company's early struggles. Mr. Firestone disclaimed much of the credit generously given him and reminded his co-workers that had it not been for their untiring aid and unflagging encouragement much of the success since won might never have been realized.

A Romance of Industry

The development of the Firestone interests to their present extraordinary extent within three decades is one of the outstanding romances of American industry. It was early in 1896, while demonstrating a rubber-tired buggy in Detroit, that Mr. Firestone got the idea that one of the world's greatest needs was rubber-rimmed vehicular wheels, and, having raised a little capital, he started the Victor Tire Co. on its career in Chicago. For four years he turned out a steadily increasing quantity of light tires and rubbered wheels. One of the few to foresee the great future of the automobile industry, he decided that a greater opportunity lay in the production of pneumatic tires. Selling his interest in the Victor plant, he went to Akron and set up his first tire plant in a little brick foundry building. With his force of a dozen men and an initial production of but 12 tires daily, he encountered plenty of competition and other handicaps in a field already crowded, considering the small outturn of motor cars.

All of which is quite in contrast with the present gigantic Akron plant and the international chain of enormous mills, the 15,000 stockholding operatives, and the capacity of 80,000 tires a day; and with which must be mentioned the big crude rubber preparation plants and warehouses in the Far East, the world's largest fabric mills, direct steamship lines, the huge footwear, metal rim, and battery output, the unique 26,000-dealer selling organization, and the million-acre rubber plantation being developed in Liberia. Whereas it had but $20,000 in cash and $50,000 on its books in 1903, the Firestone Tire & Rubber Co. in the past fiscal year sold $144,585,000 worth of goods on which it netted a profit of $7,726,870.

Akron Appreciates Benefits

Akron is particularly proud of being the birthplace of the mammoth Firestone concern, and the community has signally shown its appreciation not only of the business genius but the civic and humane spirit of the noted rubber industrialist. Mr. Firestone not only added, and is adding, immensely to the wealth of the city but has built numerous model homes, a handsome employes' clubhouse, a large athletic field, a 36-hole golf course, organized a saving bank with unusually advantageous features for workers, and has substantially encouraged every worthy local charity. So, too, many other communities, domestic and foreign, can testify to his generous interest in public and private benevolent undertakings. Of more direct interest to the rubber trade has been his long and aggressive leadership, his world-wide survey of rubber-growing regions, his success in getting the federal government to send out expeditions on a greater scale to ascertain the circumstances under which Americans might grow rubber to meet all their needs, and finally his winning of the fight to break what threatened to become a crude rubber monopoly.

That the Firestone traditions of service, initiative, strong organization, and capable administration will long be perpetuated seems well assured by the fact that Mr. Firestone's sons fully share his ideals and enterprise. Harvey S. Firestone, Jr., was but 5 years old when he turned on the steam in the original factory in Akron, but today, a perfect "chip of the old block," he is chief in charge of the great Firestone plantation in Africa as well as vice president and director in the parent company. Another son, Russell A., is vice president of the California Firestone company and vice president of the Firestone Park Trust & Savings Bank, Akron. Three other sons are planning to enter the rubber business. Raymond and Leonard will matriculate in the school of Firestone when they graduate from Princeton University. Roger with his own laboratory studies rubber chemistry at Asheville School, Asheville, N. C.

By these young men will the success of Firestone be perpetuated in the rubber industry.

ACTIVATED CARBON

The use of activated carbon in a solvent recovery system was described about a year ago in this journal.[1]

The manufacture of active carbon has been the subject of numerous patents; one of these is the Bayer process and another the Urbain process. In the first-named process the raw material—peat, sawdust, or other suitable carbonaceous material—is made into a paste with zinc chloride solution, compressed into stick form, cut into short lengths, and calcined in a rotary furnace. This is followed by a washing, sieving, and sorting, after which the product is packed in drums for transport.

The Urbain process is somewhat similar but uses phosphoric acid instead of zinc chloride. The paste is dried at a temperature of 500 to 600° C., and then further heated to about 1,200° C., at which temperature not only are all hydrocarbons destroyed, but the phosphoric acid is reduced to phosphorus by the carbon; this phosphorus distills and burns to phosphoric oxide, which is absorbed in water and forms phosphoric acid.

The carbon is washed with hydrochloric acid to dissolve out mineral matter, then dried by heating to about 300° C., and packed.

[1] India Rubber World, Oct. 1, 1929, p. 57.

The Rubber Industry in America

OHIO

The Harshaw Chemical Co., 1945 E. 97th St., Cleveland, O., has announced the opening of an office at 123 E. Sixth St., Cincinnati, O., with Wm. A. Bauman, sales manager, in charge. Telephone Main 7374.

The Mansfield Tire & Rubber Co., Mansfield, O., has purchased the name and equipment of the Century Tire & Rubber Co., Chicago, Ill. Century products, including tires and tubes, will be manufactured by the Mansfield plant.

The Ohio Rubber Co., Willoughby, O., has awarded a contract for the erection of an addition of brick and steel, 120 by 480 feet, to Building C at its plant. Construction will cost $100,000, and equipment in excess of $500,000 more. The company, which makes mechanical rubber goods and specialties, including a composite rubber and steel running board for the automobile, plans revamping its entire plant for greater efficiency by making possible the latest in production methods. Increased orders, particularly for the running board, have necessitated these changes. It is expected also to increase the number of employes. Henry Hallock is president of the rubber company.

S. W. Weiger, for many years associated with The Giant Tire & Rubber Co., Findlay, O., has been named a trustee of Findlay College.

Miller Rubber Products Co., Akron, O., has made a number of important changes in its field representatives. G. K. Meeks, former St. Louis branch manager, is now district sales manager out of St. Louis, directing sales in Kansas City and Memphis in addition to the St. Louis territory. E. P. Jones, former Philadelphia branch manager, now is district sales manager directing sales in the Philadelphia territory as well as all of Baltimore and Washington territory. H. R. Lapp, former Indianapolis branch manager, now serves as district sales manager with headquarters at Detroit, in charge of sales in Detroit, Grand Rapids, Toledo, and Indianapolis districts. R. R. Redwine, one-time assistant manager at Chicago, later branch manager at Omaha, was made district sales manager at Omaha superyising sales in the Omaha and Minneapolis territories. C. W. Adickes, former manager at Charlotte, N. C., was appointed district sales manager with headquarters at Atlanta, Ga., directing sales in Charlotte, Atlanta, Jacksonville, New Orleans, and Birmingham territories.

India Tire & Rubber Co., Akron, O., according to President W. G. Klauss, has appointed C. T. Morledge sales manager. He has been with India for four years and succeeds F. L. Ryan, who resigned eight months ago to become tire dealer and India distributer in Los Angeles, Calif. Since that time and until his recent appointment Mr. Morledge in the capacity of assistant sales manager directed India sales.

Miss Maybelle O'Donnell, a member of the staff of The Cleveland Liner & Mfg. Co., Cleveland, O., spent several days in New York, N. Y., during the latter part of August. She plans to visit Atlantic City, N. J., before returning to Cleveland.

Seiberling Rubber Co. held its annual picnic at Summit Beach Park on August 25. Employes of the Seiberling Rubber Co., the Seiberling Latex Co., the Akron Rubber Reclaiming Co., all of Akron, and the Kemitex Co., Wadsworth, all in O., participated in this outing. A golf tournament, a baseball game, contests for children, a bathing beauty contest, dancing, and a hunt for the letters in the word "Seiberling" were features of the day. Prizes were awarded by C. W. Seiberling.

Matthias Radioes Goodrich Message

The wide variety of mechanical goods manufactured by The B. F. Goodrich Rubber Co., Akron, O., was outlined recently by G. L. Matthias, general superintendent, mechanical goods division, on August 6, in a radio talk sponsored by the Goodrich company from New York over WEAF.

The line manufactured by Goodrich, pioneers in the field of industrial rubber goods, includes seven thousand types of rubber hose ranging in size from huge dredging sleeves, three feet in diameter, down to hydraulic brake hose, an eighth of an inch in diameter.

Another Goodrich product is a rubber gasket, 27 feet in diameter, used in large dam valves, and one molded product used by specialty manufacturers, approximately the size of a large pin head, and there are 2,000 of these units to the pound.

In the belting division all types and sizes are manufactured, beginning with the sort used on vacuum sweepers to conveyer belts weighing tons and made in lengths measuring hundreds of feet.

G. L. Matthias

Goodrich produces 32,000 rubber products, having the greatest diversity of products of any manufacturer in the rubber industry.

GOODRICH PLAY DAY

Left to right: P. R. Rohrbacher, manager, Goodrich baseball team; R. T. Griffiths, vice president and general manager, Miller Rubber Products Co., Inc.; J. D. Tew, president of the Goodrich company; and C. W. Leguillon, manager of Goodrich machine development department.

Goodrich Operations

The B. F. Goodrich Co., Akron, O., is transferring all boot and shoe manufacturing facilities at its Akron plant to the Hood Rubber Co., Watertown, Mass., a subsidiary. Only executives, foremen, and other key men of the boot and shoe department will be transferred to the eastern plant. The boot and shoe advertising department has been established in Watertown under the direction of R. W. Marquard. All mechanical goods operations

now conducted at Hood will be transferred to Akron. The transfer, when completed, will effect 800 to 1,500 Akron workers.

One of the largest industrial picnics of the season drew thousands of B. F. Goodrich employes and their families to Chippewa Lake Park on August 11 for the annual play day program. All departments of the Goodrich offices and factories were closed for the event.

A feature at this year's picnic was sending out 1,000 balloons. An award will be made to the finder of the balloon traveling the greatest distance from Akron. Various other contests were planned for the day's entertainment among which were a number of baseball games between department groups for the Goodrich championship.

Putnam Balloon Tire Patent Decision

RECORD was made last month in this journal that the United States Circuit Court of Appeals for the Sixth Circuit has upheld the ruling that claims 1 and 2 of the Putnam patent for so-called balloon tires are invalid, sustaining the District Court for the Eastern District of Michigan. In this connection it is of interest to note also the rule of the United States Patent Office that changes of form, proportions, or degree only, or attaining better results by substantially the same original means does not constitute patentable invention. In other words, changing the cross-section of a balloon tire from an ellipse as shown in United States Patent No. 1,433,008 to a circle as claimed by Putnam in United States Patent No. 1,537,879 was not patentable under the rule indicated above.

The suit mentioned above was originally brought in the federal court at Detroit on the Putnam balloon tire patent which purported to cover all tires of large size in proportion to their load and having thin sidewalls and designed to operate with low air pressure.

The defense produced evidence showing that as far back as 1910 The B. F. Goodrich Rubber Co. had introduced cord tires in this country answering to all the specifications of the patent. Incidentally it was brought out that such balloon tires were used and have continued to be used since that time by the King of England on his personal cars. Ralph Mulford, famous racing driver, also shares honors with the British monarch as being one of the earliest users of balloon tires.

It was also shown that A. H. Marks, an officer of The B. F. Goodrich Rubber Co., used balloon tires in Akron as early as 1910. A further defense was that the patent was indefinite in not saying how large or how thin or how low-inflated the tires must be to come within the patent.

The decision is a confirmation of a statement issued by officials of The B. F. Goodrich Rubber Co. when the long expected balloon tire patent was issued in 1925 to the effect that the patent was fully anticipated by that company's early activities in the field of cord tires. That statement, taken as a challenge, is said to have caused the plaintiff to single out the Akron company as its adversary in the test suit.

Goodyear Activities

The Goodyear Tire & Rubber Co.'s attempt to solve in a measure the unemployment problem is known as the "Slusser plan" because it was devised by C. Slusser, vice president and factory manager. It provided that all factory employes who had been laid off on June 1 and were still in Akron be taken back on a basis of seven weeks' work in every eight and that those who had continued at their posts agree to this same basis. This suggestion met with enthusiastic approval.

Announcement was made by Goodyear of the following promotions in both the production and personnel departments. E. T. Ruffner and W. C. Wright have been named general foremen, each in charge of several departments. Both men are flying squadron members. K. L. Reynolds is the new manager of labor division under whom the following serve in their respective capacities: N. R Miller, manager of the employment division; J. T. Kidney, manager of police, fire, safety, and compensation divisions; Dr. J. S. Millard, head of the Goodyear hospital; and C. N. Evitt, secretary of the industrial assembly. J. W. Henderschott has been named manager of Goodyear Hall, and A. C. Horrocks is the new director of education at Goodyear University. T. W. Prior succeeds Henderschott as manager of office employment.

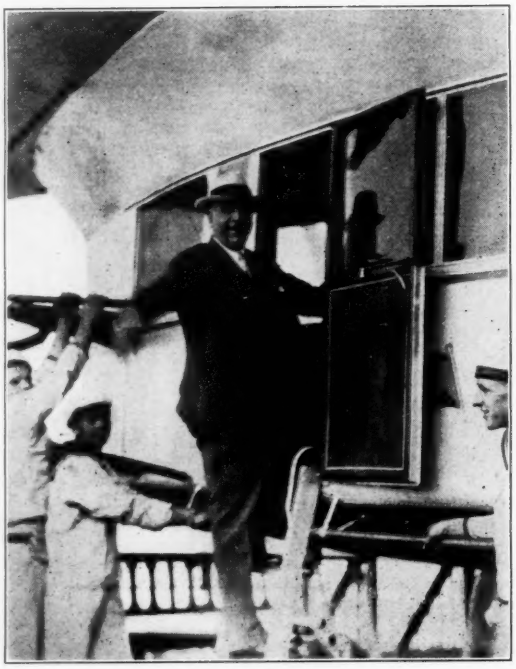
Edward Gower, foreman of masons at the Goodyear, Tire & Rubber Co., on August 6 was awarded his 25-year diamond service pin in addition to $250 in gold.

Goodyear employes held their annual picnic at Chippewa Lake Park on August 16. About 45,000 attended. The auto parade, many miles long, had several floats. The program consisted of land and water sports, including tennis, horseshoe and golf tournaments as well as running races and athletic events. Two Goodyear blimps were on hand to make flights with employes and their families. The flying squadron gave an exhibition. At 9 p. m. a fireworks display took place.

LITCHFIELD BOARDS AIR TAXI

PAUL W. LITCHFIELD, president of The Goodyear Tire & Rubber Co., Akron, O., arrived from Europe on July 31 at New York, N. Y. He was met at quarantine by the Goodyear dirigible "Mayflower," was taken aboard, and after a short flight over the city he was then landed at Holmes Airport, from where he was driven to his hotel. This was the first time in history that an airship ever made a landing on an ocean liner.

The blimp was piloted by Karl Fickes, with Robert Wilson as co-pilot. Coming up toward the stern of the "Bremen," which is the speediest ocean liner in the world, Pilot Fickes cut the motors when a few feet out and set the "Mayflower" down carefully upon the after deck. A landing crew recruited from among the "Bremen's" sailors, grasped the landing ropes and the hand rails and brought the sky rider to a standstill without even a jar. The spectacular landing was made in a tiny 35-foot square of cleared space on deck.



President Litchfield stepped aboard; there was a lot of waving of hands, and the little dirigible sailed away with her passenger. Though he was given an hour's aerial tour of New York before landing, President Litchfield arrived at his hotel several hours before the rest of the party, which had remained on the boat to complete the journey.

While in Europe the Goodyear president spent several weeks at Wolverhampton, England, and other cities on business matters. He visited also the Zeppelin offices at Friedrichshafen to further plans for the inauguration of trans-oceanic Zeppelin service. His landing by blimp was in the nature of a demonstration of how air ship service may be extended for speeding communication between ship and land.

He was accompanied from Europe by his two sons and other Goodyear officials, but they were not included in the special landing party. After a day in New York, Mr. Litchfield returned to his home in Akron.

EASTERN AND SOUTHERN

William B. Wiegand, of the Technical Dept., Binney & Smith Co., New York, N. Y., has been touring Canada since the middle of August in the interests of his company, the makers of Micronex. Mr. Wiegand is a native of Canada, where he always meets with a cordial reception from his many social and business friends.

United States Rubber Co., New York, N. Y., together with the Dewey & Almy Chemical Co., Cambridge, Mass., have entered into reciprocal license agreements for manufacturing latex bonded brake lining. Both organizations perfected methods independently for utilizing rubber latex as a binder in brake linings and other asbestos products. Their reciprocal agreements are such that each company is to have the advantage of any further refinements made as a result of the research of either of the participating companies.

C. E. A. Dias, of Ceylon, who is a visitor to the United States, is the owner of the Wawulugala, Millinya, and Mukalana estates that have been awarded prizes for quality of product in far eastern and foreign exhibitions. The Johnston Rubber Co., 133 Front St., New York, N. Y., represents the Dias interests in the United States.

George F. Hasslacher has resigned from the Roessler & Hasslacher Chemical Co., New York, N. Y., effective August 1. At the time of his resignation he was a director and secretary. As an employe of the company, Mr. Hasslacher was active as manager of the commercial development division and manager of the advertising department. He will spend the coming months with personal affairs and in traveling, it was explained.

The Harshaw Chemical Co., Cleveland, O., has announced the opening of its Pittsburgh, Pa., offices with Howard L. Haney, sales manager, in charge, at Terminal Bldg., Carson St. and Terminal Way, S. S. Telephone, Hemlock 8725.

Martin Rubber Co., Inc., manufacturer of mechanical rubber goods, Long Island City, N. Y., states that it also makes dental rubber.

Banca Commerciale Italiana, 62 William St., New York, N. Y., reveals that it has been informed that the Société Générale des Etablissements Bergougnan, Clermont-Ferrand, France, has lately disposed of its share in the Società Anonima Bergougnan Italiana, Turin, Italy, to a group composed of representatives of the leading industrial companies of Turin and headed by the Banca Commerciale Italiana, Milan, Italy. It is not unlikely that the Società Italiana Pirelli, Milan, may participate to a certain extent in this newly created group, and in this connection it is also said that several rubber companies may join together to rationalize production.

Meyer & Brown, 347 Madison Ave., New York, N. Y., one of the oldest crude rubber importing and dealing houses in the industry, has announced that its activities in the market are to be restricted and that changes have been effected in the personnel.

"In view of the fact that we are planning to reduce our business activities," an announcement stated, "Walter H. Dickerson has resigned as vice president and treasurer, effective immediately. W. L. White has been elected vice president of this corporation, and W. G. Smith, Jr., has been elected treasurer.

Roessler & Hasslacher Chemical Co., 10 E. 40th St., New York, N. Y., reports the election of Dr. Edward A. Rykenboer to the Board of Directors. J. Carlisle Swain was elected assistant secretary.

New York Brokerage Co., crude rubber broker, formerly at 27 Beaver St., has moved to 18 Burling Slip, New York, N. Y. Telephone, John 0843-0844-0845.

Pennsylvania Rubber Co., Jeannette, Pa., through President W. O. Rutherford, announced the following appointments. C. G. Morrill was elected treasurer, replacing A. H. Price, who resigned after many years of service. A. D. Welty was made assistant treasurer, and C. H. Wolfe was promoted to the position of secretary.

A. A. Garthwaite, vice president and general manager of Lee Rubber & Tire Corp., Conshohocken, Pa., with his two daughters sailed for Europe on August 2. After five days in England and Scotland, they toured Holland and Germany, spending some time in Hamburg, Dresden, Cologne, and Berlin, where Mr. Garthwaite visited Lee distributers. They will sail for home on September 3.

National Aniline & Chemical Co. has reported the completion of improvements at its distributing branch at Charlotte, N. C. This includes sales offices and warehouse for heavy chemicals, textile dyestuffs, reagents, and insecticides. Despite mill curtailment and slower demand this year for dyes and chemicals in the South, W. H. Willard, manager of the Charlotte branch, looks forward to an increasing volume of business. National Aniline is a subsidiary of the Allied Chemical & Dye Corp., and an affiliate company with others in this group.

H. L. McClaren, president of the Ajax Rubber Co. and the McClaren Rubber Co., Charlotte, N. C., has announced the appointment of H. E. Williams as general sales manager for the two companies, succeeding H. W. Roland, who resigned to accept a position with the Reo Motor Car Co. Mr. Williams has been associated with the McClaren sales organization for several years. At the time of this promotion he was supervisor of the Pacific Coast Division for the combined companies.

Ajax Rubber Co., now being conducted at the plant of its subsidiary, McClaren Rubber Co., Charlotte, N. C., reports operating to a daily capacity of 1,500 tires, a figure never before reached. At present the plant, working on day and night schedules, manufactures both Ajax and McClaren tires. It is understood that the tires are sold as soon as they are made. The new machinery recently shipped from Racine, Wis., to Charlotte also is in use. The payroll of the manufacturing department now approximates $9,500 per week, a sum not previously equaled.

Intercontinental Rubber Co., Wilmington, Del., reports that production of guayule rubber in Mexico was suspended during May with the closing of the Catorce factory. All factory units are being maintained in excellent physical condition, and production can be resumed on short notice when circumstances justify it. The first factory unit in California located in Salinas will begin operations in January, 1931, with an initial capacity of 15,000 pounds of Ampar guayule rubber per day.

National Safety Congress

The nineteenth annual safety congress and exposition will be held September 29 to October 3, inclusive, at Pittsburgh, Pa. The Rubber Section will hold its meetings in the Fort Pitt Hotel, where the following papers will be read:

"Rubber Reclaiming and Its Hazards." A. P. Regal, electrical engineer, The Philadelphia Rubber Works Co., Akron, O. Discussion led by C. W. Smith, assistant general superintendent, U. S. Rubber Reclaiming Co., Buffalo, N. Y.

"How We Can Best Serve the Injured Employe." W. T. Leonard, chairman, Ohio Industrial Commission, Columbus, O.

"Creating Job Value Consciousness." M. A. Clark, industrial relations manager, Detroit Plant, United States Rubber Co., Detroit, Mich.

"Safeguarding the Health of the Rubber Worker." P. A. Davis, The Goodyear Tire & Rubber Co., Akron, O.

"Safety in the Design of Equipment Used in the Rubber Industry." M. J. Maryanski, design engineer, The B. F. Goodrich Co., Akron, O.

"Carry On." C. L. Hungerford, safety director, Firestone Tire & Rubber Co., Akron, O.

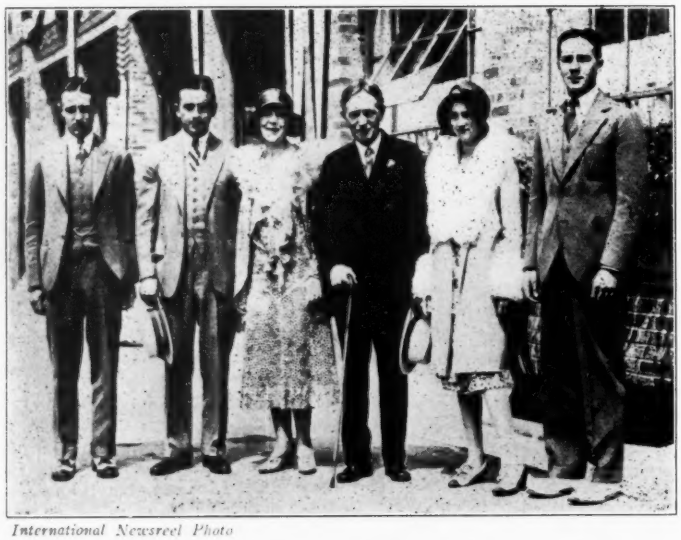
"A Foreman's Opportunity in Accident Prevention." W. H. Fleming, assistant production superintendent, The Goodyear Tire & Rubber Co., Akron, O.

"Safety Kinks," (Film strip). T. G. McKenna, manager, safety division, The Goodyear Tire & Rubber Co., Akron, O.

The Airplane Industry

A new industry is becoming established in America. Last year it represented a total investment of about $700,000,000. More than 6,000 commercial and military planes, with a total value of over $44,000,000, were manufactured. Production of aircraft engines exceeded 7,000 for the year, valued at $26,000,000. American airplanes in 1929 flew nearly 200,000,000 miles.

Aircraft, including airplanes, seaplanes, flying boats, amphibians, airships, and dirigibles, large and small, and recently gliders, are taking a place of rapidly increasing importance in our civilization, Horace C. Knerr in *Iron Age*.



International Newsreel Photo

Harvey S. Firestone with Members of His Family. Left to Right—Raymond C., Russell A., Mrs. Firestone, Mr. Firestone, Elizabeth I., and Leonard K. Firestone.

NEW ENGLAND

Harvey S. Firestone, Sr., president of the Firestone Tire & Rubber Co., Akron, O., together with other Firestone officials, last month inspected his company's plants in New England. He was the guest of honor at several luncheons and expressed himself as pleased with conditions. Mr. Firestone is making a tour of the tire company's plants throughout the country, according to George W. Danielson, of the New Bedford unit, which is one of the largest tire fabric plants in the world. Mr. Firestone is accompanied by his three sons, Russell, Raymond, and Roger, whose polo playing is an important topic of conversation and source of pride with their father.

Another Firestone visitor is the "Firestone" piloted by Wm. M. McConnell. The big monoplane, used frequently by Mr. Firestone for trips to his widely placed business activities and also by his tire company officials in attending conferences, on August 17 landed at the Boston Airport, where it was welcomed by A. T. McGrath, Boston branch manager. The plane participated in the festivities at Cambridge on August 18, where Mr. Firestone was a guest of the Chamber of Commerce in connection with the opening of a large Firestone service station in that city.

David Lederer, in his efforts to preserve the Bauman Rubber Co., which his father and Maurice Bauman had founded in New Haven, Conn., forty-three years ago, filed a petition in bankruptcy in which he alleges he has no assets with which to meet liabilities of $164,362.44. He had used his personal property as security for endorsements for the rubber company, and the reduction of claims by creditors against the company to judgments wiped away his personal fortune. Mr. Lederer's petition will have no effect on the affairs of the rubber company, which has been successfully operated since last August under receivers.

Portland Rubber Co., Portland, Me., maker of rubber goods including rubber bands, hot water bottles, toys, garden hose, raincoats, tires, etc., reports that it is quite busy and enjoys a large volume of business at present.

Robert C. Kelley, purchasing agent of the Converse Rubber Co., Malden, Mass., has been appointed national chairman of the textile committee of the National Association of Purchasing Agents, succeeding E. H. Hawkins, of the DuPont company, who was obliged to give up the post owing to pressure of work from his recent promotion to director of purchases of that company. Mr. Kelley recently addressed the Rotary Club of Franklin, Mass., on "Buyers and Buymanship".

The Fisk Rubber Co., Chicopee Falls, Mass., has announced the resignation of Miss May O'Connor, for twelve years in the advertising department and assistant to the advertising manager. Miss O'Connor, who has accepted a position with a New York concern, was succeeded by her sister Alice, for several years connected with publicity work at Fisk.

The United States Rubber Co. moved the offices of its Footwear Department from New York, N. Y., to Naugatuck, Conn., on August 18, according to an announcement by F. B. Davis, Jr., president and chairman of the board of directors. The United States Rubber Co. is the largest manufacturer of rubber footwear in the world. Its selection of Naugatuck as footwear headquarters has a historical interest, as the first vulcanized rubber footwear ever manufactured was made there by the company in 1843, and production has been continuous ever since.

The rubber company also will close its Fabric Inspection Department at Millville, Mass., in September. Cloth ordered for plants of the United States Rubber Co. is being shipped from the Millville plant by the company from whom it was purchased. At Millville the materials are inspected and tested and then reshipped to the different plants which had requisitioned the materials. Commencing in September the old system will be reestablished. Materials ordered for the individual plants will be shipped from the maker directly to the user instead of first to Millville.

J. A. Horner, district manager of tire sales in the Boston, Mass., district of U. S. Rubber Co., recently announced that E. A. McCoy, formerly manager of the Kelly-Springfield Tire Co.'s Boston branch, has been appointed his assistant.

Firestone Footwear Co., Hudson, Mass., late last month adopted a new schedule of working hours, it was announced by Employment Manager Clifford Reynolds. A four-day week, beginning on Tuesday and ending on Friday for the day shift and beginning on Monday night for the night crew, has been adopted in place of their regular hours previously followed.

The Brockton Machine Co., maker of mechanical rubber molds, 55 First St., Brockton, Mass., is moving into a one-story addition, 42 by 48 feet, recently erected at the plant.

C. E. Maynard Advanced By Fisk

Charles Edgar Maynard, former mechanical superintendent of The Fisk Rubber Co., Chicopee Falls, Mass., has been appointed factory superintendent in charge of production succeeding Curtis L. Moody, general superintendent for fifteen years, who has resigned to become factory manager of the Dominion Rubber Co., Ltd., Montreal, P. Q., a subsidiary of the United States Rubber Co.

C. E. Maynard

Mr. Maynard began his work with the Fisk producing department twelve years ago, immediately after his service in the World War. He served during the war in the Naval Aviation Corps, previous to

which time he was with The Goodyear Tire & Rubber Co. He was graduated from Amherst College with a B. S. degree in 1917. Mr. Maynard was appointed manager of the process development department of the Fisk company and in 1930 he was advanced to the position of mechanical superintendent, which was closely followed by his appointment as factory superintendent in charge of production.

During his career at Fisk, Mr. Maynard designed and invented several tire machines. Outstanding are two semi-automatic vulcanizing machines, one for tires and the other for tubes, both of which were pioneer machines in the industry and are now being made under patent controlled by The Fisk Rubber Co. Mr. Maynard has also been a contributor to many technical journals and is recognized as an authority on rubber machinery.

He was born in Concord, Mass., on January 13, 1895. He is a Mason and a member of Phi Kappa Psi. His address is 74 Massasoit St., Northampton, Mass.

The Fisk executive organization will not include a general superintendent, but Mr. Maynard's new duties will approximate more than any other office the duties formerly handled by Mr. Moody.

MIDWEST

The Firestone Tire & Rubber Co., Akron, O., has appointed H. H. Hageman, for several months acting manager, as manager of the northwestern branch, Minneapolis, Minn.

Sears, Roebuck & Co., Chicago, Ill., has rescinded increases in tire prices made in its fall and winter general catalog and will continue the prices quoted in its summer sale catalog after the sale period ended on August 31, according to J. H. Westrich, manager of Sears' tire department. The company's stores will continue present tire prices unchanged. This continuation of the cheaper price of tires is made possible by lower rubber prices. The present rates will continue until about the end of December. Sears, Roebuck just opened two stores, one in Brooklyn, the other in Mt. Vernon, both in N. Y. Two additional stores are planned soon, at East Orange and Union City, both in N. J.

Wishnick-Tumpeer, Inc., 251 Front St., New York, N. Y., in expanding its technical staff, has employed M. C. Vaughn, for the past two years chemist at The B. F. Goodrich Co., Akron, O. He will be located at the Pioneer Asphalt Works, Lawrenceville, Ill., as research and control chemist. Mr. Vaughn is a graduate of the University of Illinois, where he majored in chemistry.

U. S. RUBBER CO. TIRE DEPARTMENT ACTIVITIES

Unit sales of tires to dealers during July were the highest in five years and were exceeded by only one previous July in the history of the United States Rubber Co., L. M. Simpson, general sales manager of the Tire Department, Detroit, Mich., recently announced. The sales in August held at a comparably high level, and present indications are that the last six months of this year will show a comfortable increase in dealer sales over the same period last year, Mr. Simpson declared.

L. M. Simpson

"The July record was the direct result of new improved design products priced at the lowest levels in the history of the company, and a generally strengthened and aggressive dealer organization," he added.

The only July to show a higher volume in casing sales by the United States Rubber Co. was in 1925, Mr. Simpson explained. In that year, he pointed out, a number of price advances occurred in June and July with the result that many dealers contracted for more than the normal requirements of casings in anticipation of still further advances in the fall.

M. A. Clark, director of industrial relations of the tire department, is listed among the speakers scheduled to address the Nineteenth Annual Safety Congress of the National Safety Council at Pittsburgh, Pa. Mr. Clark will address the Rubber Section on October 1 on "Creating Job Value Consciousness." Mr. Clark is a recognized authority on industrial relations work. Educated in England, he spent thirteen years in personnel work with the du-Pont organization, five years in the textile industry, and three years as director of vocational education for the Manufacturers Association of Connecticut, prior to joining the United States Rubber Co.

J. H. (Harry) Sheldon, for many years associated with the sales administration of U. S. tires, has retired from the United States Rubber Co. He was with the company about twenty-three years, much of that time as assistant to the sales manager.

A novel plan of "mass feeding" of factory workmen, in the interest of time economy, now appears as a complement to the mass production methods practiced in modern manufacturing establishments. At the tire plant thousands of workers are fed in a few minutes from unique portable metal kitchens, by which food is brought to the workman instead of the workman having to go after it.

The portable kitchens are loaded with food at a central loading station and at a given signal just before the noon whistle they dash out for different quarters of the plant. Workers line up before the "wagon" for a lunch nearly as varied as that available in the restaurant. Electric heating elements in each wagon, with a wall plug attachment, keep hot foods heated, and ice compartments maintain milk and similar items frigid until called for.

Prominent Trenton Rubber Manufacturer

IT IS ten years now since the Pocono Rubber Cloth Co. was organized in Trenton, N. J., and no small part of its success is attributed to its vice president and treasurer, Holland B. Slusser, whose entire business career, which began in 1910, has been devoted to the rubber industry. For three years he was chemist with the Diamond Rubber Co., Akron, O., and held a similar position from 1913 to 1916 with The B. F. Goodrich Co., also in Akron. Then he became plant superintendent of the Knight Tire & Rubber Co., Canton, O., and remained there until 1917, when he was chosen division superintendent of the Hodgman Rubber Co., Tuckahoe, N. Y. He left that concern in 1920 to join the newly created Pocono Rubber Cloth Co. as vice president. He assumed the duties of treasurer also in 1923.

Blank-Stoller, Inc.

H. B. Slusser

Mr. Slusser was born on April 10, 1887, in Louisville, O. He attended the public schools of New York, N. Y., Canton, O., high school, and the University of Michigan. Here he majored in chemical engineering and in June, 1910, received the degree of B. S. in that field.

He is a member of Phi Kappa Sigma, the American Chemical Society, Carteret and Kiwanis Clubs, both of Trenton, and the Springdale Golf Club, Princeton, N. J. Mr. Slusser is married and lives with his family at 10 Ober Road, Princeton.

NEW JERSEY

Some products of the rubber manufacturing plants in New Jersey are holding their own; while a little decrease occurred in the production of mechanical goods. The demand for rubber cloth and tiling continues good as is also the case with hose, belting, and packing. Orders for brake lining and jar rings have decreased. Tire production continues normally. The demand for athletic footwear, however, has dropped off. Orders for swimming tubes showed a large increase during the summer, and manufacturers now find that this product will be added to other goods for salesmen to handle.

The U. S. Rubber Specialty Co., Trenton, received a request from two residents of Brooklyn, N. Y., to produce a rubber ball to carry them across the ocean. Specifications call for a ball 15 feet in diameter with an opening of 30 inches. The company has taken the matter under advisement.

Puritan Rubber Co., Trenton, contines to operate normally. The demand for rubber tiling has been very good during the summer, and prospects for the fall are promising.

Pocono Rubber Cloth Co., Trenton, announces that business during July was the largest during any month of the present year. The company recently engaged additional help to fill orders for rubber cloth.

Pierce-Roberts Rubber Co., Trenton, which had been operating with day and night shifts, now works during the day only. The company suffered a loss by lightning some time ago, and the burned building has been repaired.

Thermoid Company, Trenton, reports that business is good. The concern is busy in departments where various kinds of hose are made.

C. Edward Murray, Jr., former president of the Murray Rubber Co., Trenton, has presented to St. Michael's Orphanage, Hopewell, N. J., two Shetland ponies, a cart, saddles, and harness, for the orphan boys.

Joseph Stokes Rubber Co., Trenton, reports a decided increase in business during the past month with about 90 per cent of the equipment in operation. The company expects to operate 100 per cent during the fall. The company's plant at Welland, Ont., Canada, which had been very busy, now feels the business depression.

Volk Auto Tire Co., Trenton, has moved to new quarters at Front and Stockton Sts., where additions to the sales force have been made. The firm is distributer for the General Cord tire for Trenton and Mercer County.

The Hamilton Rubber Manufacturing Co., Trenton, inaugurated a plan to sell Viking tires and tubes direct to consumers. The company reduced the cost of its product and hopes to compete with mail order houses.

Bruce Bedford, president of the Luzerne Rubber Co., Trenton, has been spending some time with his family at Bear Lake, Pa.

The Essex Rubber Co., Trenton, states that business looks very promising for rubber heels and soles and mechanical goods. The plant now runs normally.

Whitehead Bros. Rubber Co., Trenton, announces that business is very good in all departments, with the plant operating to capacity. The company has granted a week's vacation to all the older employes. The Whitehead company is the oldest rubber company in Trenton.

The American Telephone & Telegraph Co., has purchased a 200-acre site near Elizabeth to relieve space pressure now manifesting itself due to the growth of the Bell Laboratories, 463 West St., New York, N. Y. The A. T. & T. company plans to erect another laboratory for expansion. The offices of Bell Laboratories on West St., however, will continue to make the most important researches, according to Walter S. Gifford, A. T. & T. president.

MURRAY'S GENERAL MANAGER

When the Murray Rubber Co., Trenton, N. J., last year underwent several changes in personnel and policies to restore it to its former high standing, it was necessary to install as general manager a man of outstanding ability to carry on efficiently the reconstruction work. Caldwell & Co., Nashville, Tenn., banking concern, financial backer, and chief factor in the Murray reorganization, selected Alfred Hume Branham for the responsible position; and time has revealed the wisdom of this choice.

Mr. Branham was born in Nashville on January 19, 1896. His formal education was received at the Branham and Hughes Military Academy, the University of Mississippi, and Vanderbilt University. Answering his country's call to arms, he enlisted in the United States Marine Corps in May, 1917, and served about a year in France with the Machine Gun Battalion, Fifth Brigade, U. S. Marines. He was honorably discharged in August, 1919. Mr. Branham then returned to college to complete his interrupted courses and was graduated from Vanderbilt in 1920, a B. A.

From 1921 to 1925 he served as commandant at the Branham and Hughes Military Academy. In 1926 he was employed by Caldwell & Co. in the buying department and remained there until 1929 when he went to the Murray company. He is now a director as well as vice president and general manager of the rubber firm.

Mr. Branham is a member of the Beta Theta Pi Fraternity, the Kiwanis Club, and the Masons. He holds, too, the commission of captain in the U. S. Marine Corps Volunteer Reserve. He may be reached at the Murray company in Trenton.

Blank-Stoller, Inc.

A. H. Branham

Standard Oil Co. of N. J. to Sell Tires

The Standard Oil Co. of New Jersey announces through F. H. Bedford, Jr., a director, that it will sell automobile tires throughout the United States. Free service, a guarantee, and lower prices will be offered to the public in competition with garages, according to Mr. Bedford. The tires will be handled through the thousands of filling stations maintained by the company and its subsidiaries. The decision of the Standard Oil Co. to go into the tire business, Mr. Bedford added, was fostered by the success of the mail order houses, particularly in the less densely populated sections of the country. Prices of the most popular sizes follow:

30x3½ regular	$4.95
30x3½ oversize	5.50
29x4.40	6.80
30x4.50	7.85
29x5.50	12.05
30x5.50	12.25
31x6	13.20
32x6 6-ply	16.60

It is learned that The B. F. Goodrich Co., Akron, O., is making the tires known as the Atlas brand for the Atlas Supply Co., from which the Standard Oil Co. of New Jersey will purchase its supplies for the service stations. These tires, it is understood, are made in the factories of the Miller Rubber Co., a Goodrich subsidiary. Several weeks ago Standard representatives visited the plant of the Michelin Tire Co., Milltown, and inspected the factory. It was reported that the oil company was considering purchasing the plant to be used in manufacturing tires. This report, however, later was denied by Michelin officials. Mr. Bedford declared that the oil company had no intention of going into the tire manufacturing business as the plan will be entirely a merchandising one.

Amberex

Amberex is a new factice of amber shade made for special use in light colored rubber stocks with accelerators. It has found favor with those desiring to obtain light pastel shades of color. It is possible to use it in varying percentages with many of the best accelerators without retarding the cure to any noticeable extent and giving the finished goods a "velvet feel."

Trenton Rubber Manufacturers Exhibit at American Fair

Interesting Displays at Atlantic City Auditorium Viewed Daily by Thousands

"TRENTON Makes—the World Takes." Such is the slogan of the Trenton, N. J., Chamber of Commerce, and it was prominently featured at the exhibit sponsored by the Chamber at the American Fair held at the immense Atlantic City Auditorium, Atlantic City, N. J., from July 17 to August 27. For the purpose of bringing Trenton's industrial products to the attention of the hundreds of thousands of people who visited the famous seaside resort, the Trenton Chamber of Commerce contracted for 4,400 square feet of exhibit space in the American Fair.

The Trenton section was the largest single exhibit unit there and was divided into thirty-six separate booths in which were displayed goods of forty-seven Trenton manufacturers including seven in the rubber industry and one maker of rubber mill machinery. The value of the Trenton display was estimated at nearly $81,000,000 and represented the labor of more than 15,000 employes. The space was furnished gratuitously by the Chamber to these manufacturers, and the organization had a full-time representative on the job. In the rubber division of Trenton's striking and successful exhibit were the following booths:

Booth T-15, of the Murray Rubber Co., contained 400 square feet of exhibit space showing a Murray Tire Store front towards two aisles. The front emphasized the fact that the Murray Tire Store is not a chain store, but a nation-wide group of stores. The Murray Balloon 6 Ply DeLuxe, Murray Cord, and Murray Bus Cord tires were conspicuously placed.

Two companies, William R. Thropp & Sons Co., manufacturer of rubber mill machinery, and the Acme Rubber Mfg. Co., maker of mechanical rubber goods, shared Booth T-29. The Thropp display consisted of an experimental mixing mill featuring a safety device that will stop the rolls in two inches of travel. A 6 by 16 steam individual laboratory motor driven mill was complete with all cut gears. The company showed, too, a hand reset electrically held safety brake for use on individual or motor driven lines of mills. Another interesting item was a hollow chilled iron roll.

The Acme group included transmission belting, fruit jar rings, tubing, and hose. The latter ranged all the way from molded, corrugated garden hose, air, vacuum, gasoline, and fire hose to 12-inch dredging hose. In the tubing display, power and pump tubing were prominently featured.

The Hamilton Rubber Mfg. Co. in Booth T-30 had a full line of mechanical rubber goods. Various grades of packings were to be seen. There was also a wide variety of wrapped hose from small sizes of garage air hose and tubing to large sizes of suction hose and even samples of heavy duty steam and deep well drilling hose. Different types of dredging sleeves caught the eye as did a complete display of packings for oil well pumps, a complete section of heavy duty municipal fire hose, both conveyer and transmission belting, and jar rings. Attractive rubber floor coverings, including tile and matting, proved attention-arresting.

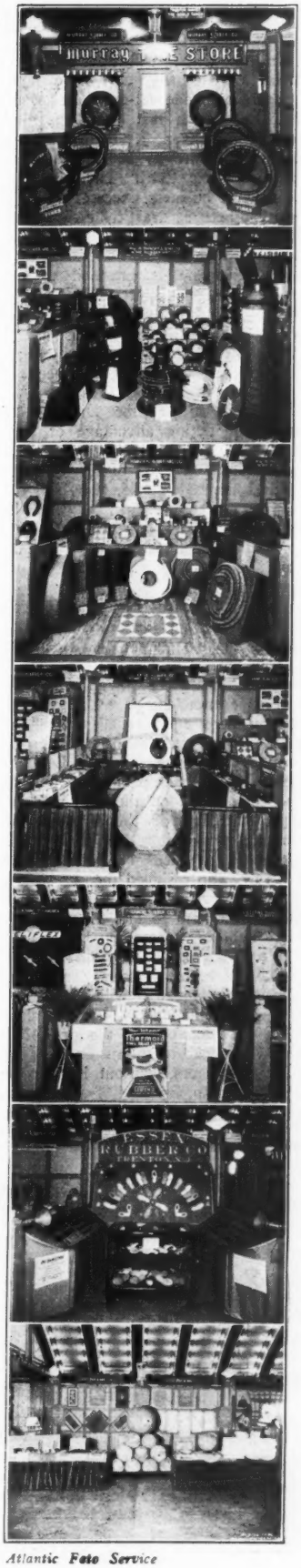
The Luzerne Rubber Co. and the Home Rubber Co. made Booth T-31 well worth examining. The Luzerne products, hard rubber specialties, were: acidproof pipe, findings, pumps, water closet seats, etc. The railing in front of the booth, moreover, was made of hard rubber piping.

Belting, hose, packings, and soft rubber mechanical specialties were exhibited by the Home Rubber Co. A large roll of rubber transmission belting immediately conveyed the impression of "power" in this display.

In Booth T-32 The Thermoid Company made much of its brake lining in a very clever and educational layout. Showing the many automotive products and mechanical rubber goods manufactured by Thermoid, the booth revealed asbestos in its various forms from the raw material to finished asbestos textiles.

Two booths, T-34 and 310, of the Essex Rubber Co., furnished other fascinating subjects. T-34 was devoted exclusively to footwear. A wide array of Tite-Edge rubber heels and soles was plainly visible, for dozens of different styles of soles and heels were displayed, some on finished shoes. The second booth contained colorful specimens of Essex rubber mattings and its popular new product, the rubber Pep Bal. In the center of the display was a pyramid of inflated 18-inch Bals with patented valves, and on the very top rested a huge inflated Bal at least three feet in diameter. Rubber quoits, force cups, and soap dishes likewise had prominent positions. In this booth many direct sales were made.

Clifford H. Oakley, president of the Essex company, Bruce Bedford, Luzerne president, and J. Edward Myers, of the Acme Rubber Co., composed the manufacturers' committee.



Atlantic **Foto** *Service*

PACIFIC COAST

United States Rubber Co., Inc., Pacific Division, has held its own during the general trade let-down, especially in comparison with last year, according to General Manager J. B. Brady, whose headquarters are at 300-336 Second St., San Francisco, Calif. The correction of the general business excesses of 1928 and 1929 has been so drastic, he says, that any change from now on could hardly be otherwise than for the better. The United States company is gratified to note a very encouraging improvement, and, while gradual, Mr. Brady says, it gives every evidence of being continuous and long-lived. All the lines put out by the company seem to be sharing quite equally the betterment in sales. Treasurer W. H. Gilbert of the Pacific Division retired August 1, taking advantage of the pension plan available to employes with twenty or more years of service who have reached the age of 65. Mr. Gilbert had been in the company's employ 43 years.

Goodyear Tire & Rubber Co. reports normal production at its Los Angeles, Calif., plant, and that its sales in July were the largest of any month in the company's history. Prospects for fall and winter trade are regarded as excellent. Recent visitors to the plant have been Clifton Slusser, vice president of the parent company in Akron, O., and general superintendent of all Goodyear production here and abroad, and Treasurer P. E. H. Leroy, also of the Akron company. After inspecting the Los Angeles plant, Mr. Slusser paid those in charge a fine compliment on the condition and the high efficiency of the works. Accompanying the visitors on their return to Akron was Vice President Edwin J. Thomas, who resigned the superintendency of the Los Angeles plant on August 1 to become assistant to Mr. Slusser at Akron. Mr. Thomas' successor, Leroy Tomkinson, took charge on August 15.

The "Volunteer," baby Zeppelin of the Goodyear company, which has been in operation in and about Los Angeles since June, 1929, has been in the air 1,428 hours on 1,750 separate flights and has carried 3,502 passengers, without hurt to anyone or damage to anything, has been laid up at the Goodyear dock adjoining the Los Angeles tire factory for a couple of months. During that time the gas bag will be supplanted with one of much greater capacity and be otherwise overhauled in order to increase the ship's traveling radius and carrying power.

American Rubber Manufacturing Co., Oakland, Calif., found a noticeable improvement in business during August, the volume of sales being much better than in July, and the latter month's business being more than that of June. According to Col. J. L. Dodge, treasurer, the company is making a fair amount of heavy hose and belting as well as a general line of mechanicals and is doing much roll covering for paper mills in the Northwest.

United Rubber Corp., 37 Arkansas St., San Francisco, Calif., according to President Herbert King, reports that business has been exceptionally good, with encouraging prospects. Although one of the smaller rubber manufactories in the San Francisco region, it is rated one of the most progressive. The works are running to full capacity, and as soon as additional equipment which has been ordered is received, the plant will be put on a 24-hour daily schedule. The concern specializes in various hard rubber and molded products. The officers are: President, H. King; vice president, Walton R. Smith; and secretary and treasurer, S. B. Sargeant.

The Rubber Club is a new organization of leading tire distributers in Southern California. It is designed to regulate business in its field and especially to overcome various unethical and unprofitable practices that have been too long tolerated. The officers are: President, Frank T. Price, Nelson & Price; first vice president, J. W. Lauchlan; second, F. L. Ryan, Ryan & Mosher, Ltd.; secretary, C. A. Turney, Wynns' Tire & Rubber Co.; assistant secretary, N. Giulii; treasurer, L. H. Clawson, Motor Tires, Inc.; and all of Los Angeles, Calif.

Samson Tire & Rubber Corp., Los Angeles, Calif., continues to increase production steadily and is confident of substantial improvement in sales for the remainder of the year. During the past month the finishing touches were put on the executive offices in the big new works, 5725 Telegraph Road, and arrangements were made for moving the staff from the offices in the wholesale branch at Eighth and Crocker Sts.

Sherbondy Rubber Co., Norwalk, Calif., according to Secretary-Treasurer George Ledoux, has lately been installing additional equipment for the manufacture of rubberized wallboard and hard rubber faced insulated paneling. Sales are improving for other specialties, such as hard rubber toilet seats, rubber carpeting for miniature golf courses, and mechanical goods.

A. H. Weir, for the past two years in charge of the Los Angeles, Calif., branch of H. Muehlstein & Co., Inc., 728 S. Hill St., has returned to the company's New York, N. Y., office, and Henry M. Rose has returned to his old post in Los Angeles, after a couple of years' service in New York.

Golden State Rubber Mills, 1920 E. Vernon Ave., Los Angeles, Calif., is running close to capacity with excellent prospects for improvement in the near future. According to Secretary-Treasurer G. H. McDonald, business has picked up in the past six weeks. In addition to many staple products the mills produce numerous patented specialties in hard and soft rubber and celeron. President Emmet S. Long is likely to remain in Europe for several months longer than he intended, establishing an enterprise not connected with the concern which he heads in Los Angeles.

Firestone Tire & Rubber Co. of California is steadily stepping up production at its Los Angeles, Calif., plant and expects to be running close to its recently doubled capacity within a few months. A recent visitor has been L. H. Jackson, vice president of the parent company in Akron, O., who, with Vice President and General Manager R. J. Cope of the Los Angeles plant, has been making a survey of coast sales conditions. The California concern has recently launched an extensive sales campaign with many striking devices designed to show how competition of the keenest kind can be met in price, quality, and service. C. A. Myers, director and for many years Firestone supervisor of plant construction and engineering, directing the planning and erection of most of the Firestone factories here and abroad, has retired from active service and is now living in Los Angeles. Vice President and General Sales Manager R. C. Tucker, who has been ill, is recuperating and will return to his office on September 1.

Pacific Goodrich Rubber Co., Los Angeles, Calif., notes improvement in sales and expects to quicken output soon to replace depleted stocks of finished products. The factory had its third annual picnic on August 11, at Brookside Park, Pasadena, at which about 800 attended, including all the company executives. The Los Angeles wholesale branch, in charge of F. L. Hockensmith, has been removed from 1392 E. Seventh St., where it had been for many years, to 3430 S. Hill St., quarters formerly used by the Miller Rubber Co., which have been enlarged and remodeled. The footwear branch of the Goodrich concern will be consolidated with that of the Hood Rubber Co. at 1931 Bay St.

PACIFIC GOODRICH RUBBER CO.'S WAREHOUSE IN LOS ANGELES, CALIF., WHERE RUBBER, COTTON, AND PIGMENTS ARE STORED

Goodyear Official's Rapid Promotion

FURTHER evidence that the Southwest is Goodyear proving ground for executives is afforded in the recent appointment of Leroy Tomkinson as general superintendent of the company's big plant in Los Angeles, Calif. Incidentally the selection again emphasizes the fact that the company is only too willing to advance promptly loyal coworkers to positions of much responsibility even though comparatively young, provided they have shown required capability.

Leroy Tomkinson

Mr. Tomkinson was born in Akron, O., on December 13, 1895. He attended South High School, Akron, and afterward Akron University, graduating with a degree in science. Directly he went to the Goodyear establishment in his native city and was placed on special work. In 1926 he was appointed foreman of truck tires and in 1928 was made manager of the Flying Squadron, a position in which he displayed such exceptional managerial ability that he was deemed the most fitting successor of General Superintendent Edwin J. Thomas when the latter was called lately to Akron from Los Angeles to become assistant to Vice President Clifton Slusser.

The new official is a Mason and a Shriner, and his favorite diversions are golf and handball. He is married and has two children. Since August 15 he has been living at 2632 Raymond Ave., Los Angeles, Calif. His business address is at the Goodyear works, 6701 S. Central Ave., Los Angeles.

Oil Well and Refinery Business Dull

Overproduction of crude oil and at the same time of its derivatives, gasoline, lubricating oil, and asphalt, with the consequent official prorating of output from the 10,365 wells in California and several thousand more in the entire Southwest, has been one of the big adverse factors with which rubber manufacturers on the Pacific Coast have had to contend for several months. Some of the largest users of crude oil, such as railroad companies, have been buying less than half as much crude as a year ago, and still a vast amount of crude and its products is in storage. As soon as the latter shows a large decrease, which many believe will be in the near future, rubber concerns expect that a brisk demand will be felt again for their many staple and special articles for the oil fields and refineries.

Don't Sit Back

Too many are just sitting back, doing nothing, mumbling, "What is the use?" Yet there is a lot to be done right now that is mighty important. Buyers should look straight ahead and realize that the present period of readjustment will eventually put us in a position for better times.

This is a time for clear-sighted, energetic purchasing policies. Be commodity minded! Concentrate on the opportunities as they present themselves and you can both save and make money for your company.—*Roger W. Babson.*

CANADA

As stated in the last issue, rubber goods manufacturers are considering an adjustment of prices on mechanical rubber goods, whereby the sales tax reductions of 1929 and 1930 will be included in the price instead of being deducted as 2 per cent of the face value of the invoice as at present.

Dealers and manufacturers alike report a heavy demand for garden hose this year. Some manufacturers expect their sales volume to exceed the 1929 figures. The peak season in garden hose sales is claimed to be over, but each warm spell stimulated the movement. From now on, however, dealers do not look for any maintained stimulation in sale.

Since preserving time is now at hand, sales movement in rubber rings is maintained and will continue in plentiful demand for some time to come.

Among the booking prices recently issued for fall business are those named by wholesalers on rubber hockey pucks.

The shoe trade generally seems to believe that black shoes will have a big lead over colors for Fall, with browns a fairly good second; so it is wondering how this will affect the galosh situation. Does it mean a big season in black overshoes? It will be surprising if black is not stronger than it has been for many seasons past, while brown should occupy a less dominating, though still an important position.

Hon. E. B. Ryckman, president of the Dunlop Tire & Rubber Goods Co., Ltd., Toronto, Ont., and a distinguished lawyer and business man, recently was selected by the new Conservative Government as Minister of National Revenue. This will be his second tenure of office. He was Minister of Public Works in the short-lived government of Rt. Hon. Arthur Meighen in 1926. He has represented Toronto East in the House of Commons since 1921. Always prominent in the House, Mr. Ryckman has been a leader of Toronto Conservatives for many years.

D. E. Rogerson, of the Dunlop Tire & Rubber Goods Co., Ltd., Toronto, Ont., has been appointed to the executive committee of the Canadian Bicycle and Sport Goods Association.

Dominion Rubber Co., Ltd., Montreal, P. Q., on August 15 closed permanently its Elmira, Ont., rubber factory, acting under instructions from Manager J. Dempsey, of Montreal, in charge of the rubber footwear division. The manufacture of tennis shoes, the main work at the Elmira plant, will be concentrated on in the company's immense factory at St. Jerome, P. Q. Mr. Dempsey states that the Elmira plant had been manufacturing 6,000 pairs a day of late and the plant is capable of producing 12,000 pairs daily. This plant, it is contended by the company, is not large enough for economical operation with conditions as they are. Curtis L. Moody has become Dominion factory manager at Montreal. He was formerly general superintendent of the Fisk Rubber Co., Chicopee Falls, Mass., U. S. A., and had been with them since 1916.

W. Milholm, representative of the James T. Goudie & Co. branch, Glasgow, Scotland, of Leyland & Birmingham Rubber Co., Ltd., arrived in Canada during the latter part of August.

The Guelph Elastic Hosiery Co., Ltd., Guelph, Ont., expects to manufacture its new "Protex" jock strap very shortly. The name "Protex" recently won the $25 prize offered by the manufacturer in the contest for a suitable name for this new product.

The Canadian Goodrich Co., Ltd., Kitchener, Ont., announced recent changes in its selling staff as follows: J. F. Archibald, resigned, is replaced by G. F. Crossman, covering the Niagara Peninsula; S. R. Sherin replaces F. A. Acheson, resigned, in the Windsor territory; while W. S. Graham will cover the Hamilton territory. A. N. Duncan left the Canadian Goodrich Co., to join the Pennsylvania Rubber Co., Akron, O., U. S. A.

Goodyear Tire & Rubber Co. of Canada, Ltd., New Toronto, Ont., has introduced a new two-piece truck and bus type valve stem, which eliminates entirely the trouble encountered in changing from one type valve to another. Twenty-five per cent of all angle valve requirements for all truck tubes 6-inch and up and all truck-bus tubes 7.50 and larger will be equipped with the two-piece valve.

Imperial Oil Co., Ltd., Montreal, according to current reports, will follow the move inaugurated by the Standard Oil Co. of New Jersey, its parent company, of selling automobile tires throughout its gasoline stations in Canada.

Foreign Trade Information

For further information concerning the inquiries listed below address United States Department of Commerce, Bureau of Foreign and Domestic Commerce, Room 734, Custom House, New York, N. Y.

Number	Commodity	City and Country
†46,640	Advertising balloons	Marseilles, France
†46,641	Galoshes, aprons, hot water bottles, etc.	Chemnitz, Germany
†46,647	Tires	Hamburg, Germany
†46,648	Tires	Hamburg, Germany
*46,649	Coats and shoes	Hamburg, Germany
†46,653	Typewriter key capsules	Hamburg, Germany
†46,667	Toys	Hamburg, Germany
*46,668	Toys	Caracas, Venezuela
†46,699	Canvas shoes	Barbados, Barbados
‡46,721	Gloves	Hamburg, Germany
*46,730	Toys	Hamburg, Germany
†46,733	Tires and tubes	St. Jean de Luz, France
†46,734	Tires and tubes	Paris, France
*†46,775	Shoes	Tegucigalpa, Honduras
*46,778	Sport goods	Glasgow, Scotland
†46,823	Hospital goods	Bombay, India
*46,831	Nipples	Montreal, Canada
*†46,838	Footwear	Padua, Italy
‡46,846	Surgical and hygienic goods	Hamburg, Germany
†46,869	Engine packings	Copenhagen, Denmark
†46,876	Tires	Mexico City, Mexico
*46,879	Dental rubber	Berlin, Germany
†46,884	Rubber goods	Tegucigalpa, Honduras
*†46,917	Rubber goods	Buenos Aires, Argentina
*†46,918	Belting	Rangoon, India
†46,921	Toy balloons	Asuncion, Paraguay
†46,966	Industrial and technical goods	Vienna, Austria
†46,988	Clothing	Chemnitz, Germany
†46,989	Sheeting and surgical gloves	Calcutta, India
*47,036	Boots	Milan, Italy
†47,051	Sport goods	Chemnitz, Germany
*†47,119	Atomizer bulbs	Rosario, Argentina
†47,135	Household sundries	Christchurch, New Zealand
†47,136	Bathing caps, surgical and seamless goods, and tires	Vienna, Austria
†47,137	Flexible buttons	Hamburg, Germany
†47,138	Fan belts	Hamburg, Germany
*†47,139	Beltings, sanitary goods, surgeon's gloves, caps, massaging rollers, etc.	Turin, Italy
†47,145	Bathing caps and belts	Rome, Italy
†47,151	Footwear	Vienna, Austria
†47,208	Toys	Rome, Italy
†47,213	Bathing caps, water bottles, aprons, and canvas shoes	Kingston, Jamaica
*†47,215	Tires and tubes	Rangoon, India

* Purchase. † Agency. *† Purchase and agency. ‡ Either

Foreign Trade Circulars

Special circulars containing foreign rubber trade information are now being published by the Rubber Division, Bureau of Foreign and Domestic Commerce, Washington, D. C.

Number	Special Circulars
2724	German Tire Exports, Month of April, 1930.
2727	Danish Production and Trade in Specialties and Sundries.
2738	Rubber Division Special Circulars, Second Quarter, 1930.
2744	British Exports of Automobile Casings, May, 1930.
2745	British Exports of Footwear, May, 1930.
2748	French Tire Exports, May, 1930.
2749	French Footwear Exports, May, 1930.
2750	German Tire Exports, May, 1930.
2751	Italian Tire Exports, First Quarter, 1930.
2763	Crude Rubber Reexports, First Half, 1930.
2767	Canadian Tire Exports, First Half, 1930.
2768	Canadian Footwear Exports, First Half, 1930.
2770	Canadian Exports of Belting and Hose, First Half, 1930.

A TURNOVER STICK STRUCK A CLINCHER builder on the right side, causing an internal injury and estimated disability of 56 days. *Rubber Section News*, National Safety Council.

Obituary

Rubber Machinery Designer

CHARLES P. STOCKTON, in charge of the machine design and experimental department of the Converse Rubber Co., Malden, Mass., died at his home in Melrose, Mass., on Wednesday, August 20, in his fifty-ninth year.

Mr. Stockton had been connected with the rubber industry for nearly forty years and had the distinction of being one of the first employes of the Converse Rubber Shoe Co., assuming charge of the cutting department when the factory opened in 1908. Prior to that he was connected with the Goodyear glove company at Naugatuck, Conn. As the industry progressed, he developed an unusual ability at designing special machinery for footwear and also turned his mechanical ability to good account in designing engraved rolls and molds for special uses. He continued to work until a few weeks prior to his death.

Funeral services were held from his late residence, Oakland St., Melrose, on August 22 and were attended by the entire staff of the Converse Rubber Co., including many of the men with whom he had worked for years and representatives from the Hood Rubber Co. and the Firestone Footwear Co. He leaves a wife and one son.

Research Chemist of Note

JULY 24 marked the passing of a fine chemist well known to the industry. Eugene Burton Smith had devoted his entire business career to chemistry and had attained much success with his research in this field. He was chemist with the Illinois Steel Co. and the Charcoal Iron Co. of America. He served also as chief chemist with the Atlantic Turpentine Co., Florida Wood Products Co., Wood Chemical Products Co., and E. W. Colledge, General Sales Agent, Inc. He was with the last-named concern at the time of his death.

Mr. Smith was born in Green Bay, Wis., on September 22, 1872. He was graduated from Armour Institute, Chicago, Ill., in 1894. Both the American Chemical Society and the American Society for Testing Materials listed him as a member. With the latter organization he was especially active on Committee D-17.

A Well-Known Rubber Man

IN THE Union League Club, Chicago, Ill., where he had been a guest for several days, Frederick L. Lamson, assistant to the president of the Kendall Co., Boston, Mass., owner of Bauer & Black, Chicago manufacturer of druggists' equipment and surgical supplies, dropped dead, a victim of heart disease, on August 14. His body was taken to Bath, N. Y., where funeral services were held on August 16.

Mr. Lamson, who was fifty-nine years old, was born at Woodhull, N. Y. He attended the University of Rochester and Cornell University, graduating in 1896. From 1900 to 1904 he was treasurer and principal of Cook Academy. The next six years saw him as assistant treasurer, registrar, and instructor at the University of Rochester. In 1910 he became manager of the cost department of the Diamond Rubber Co., and during 1913-1914 he was assistant to the works manager of The B. F. Goodrich Co., Akron, O. In 1914 he joined the Norwalk Tire & Rubber Co., Norwalk, Conn., which connection lasted many years during which period he served as secretary, treasurer, and sales manager.

Surviving the deceased are his widow, two daughters, and a brother.

Frank E. Dixon

AFTER a five months' illness from heart disease Frank E. Dixon, former vice president in charge of purchasing at the Falls Rubber Co., Cuyahoga Falls, O., died on July 28 at his home in Cuyahoga Falls. He became associated with the rubber company in its purchasing department three and a half years ago and last year was elected vice president. But he retired in March because of ill health.

Mr. Dixon was born in Rochester, Mass., forty-seven years ago. He was a 32nd Degree Mason and a Shriner.

Surviving with his widow are their four children, his mother, and two brothers.

Popular Firestone Executive

PERITONITIS following an operation for ulcers of the stomach on July 25 caused the sudden and much-mourned death of Nicholas J. Firestone, nephew of Harvey S. Firestone, Sr., and manager of the stock preparation department of the Firestone Tire & Rubber Co., Akron, O. He was born in Des Moines, Iowa, in 1894, the son of Mr. and Mrs. E. S. Firestone, and came to Akron in 1916. His father, formerly Firestone representative at Los Angeles, Calif., died four years ago.

Nicholas Firestone received his academic schooling in Canada and then took a literary course at the University of Michigan.

He began in the Firestone factory training school in July, 1916. In 1917, however, he enlisted in the infantry soon after the United States entered the war, and saw service abroad. In 1919 after the War he returned to Firestone to serve as manager of the stock preparation department.

Mr. Firestone was well known in Akron, and his death is regretted by a host of friends. He leaves several relatives, including a nine-year-old daughter, two sisters, and a brother.

Funeral services were conducted on July 28 at St. Sebastian's Church, and burial was in Columbiana, O.

JULY PRODUCTION (FACTORY SALES) OF motor vehicles in the United States, as reported to the Department of Commerce, was 262,363, of which 222,459 were passenger cars, 39,363 trucks, and 241 taxicabs, as compared with 335,475 passenger cars, trucks, and taxicabs in June, 500,840 in July, 1929, 392,086 in July, 1928, and 269,396 in July, 1927.

The Rubber Industry in Europe

GREAT BRITAIN

British-Dutch Liaison Committee

At last details of the lengthy negotiations of the British-Dutch Liaison Committee have been published. On June 26 a meeting was held in London, when the Dutch presented a rough scheme providing for the restriction of production based on 1929 outputs, to be put into effect as soon as the price of rubber remained below the average of 9 pence per pound for three consecutive months. After considerable discussion it was unanimously agreed that a voluntary scheme of cooperation was impossible, and that restriction on the lines mentioned above, involving early intervention by the respective governments, was essential if the existence of the industry was to be preserved.

On July 17 a meeting of Dutch producers was held at Amsterdam before whom were laid the proposals of the Liaison Committee to obtain government support for 25 per cent restriction of output on the 1929 output basis, native rubber to be included, with the pivotal price placed at 9 pence. Representatives of 121 rubber companies were present, representing an approximate production of 48,000 tons, out of a total Dutch East Indies estate output of some 145,000 tons, of which about 73,000 tons is produced by Dutch, Belgian, French, Swiss, and German companies. Their decisions revealed 103 votes in favor of the proposals and 18 against them, the dissenting votes including five of the largest Dutch producers with a total output of 13,880 tons. Six days' grace were allowed to representatives who voted, to give them an opportunity to reconsider their decision. The second vote showed 112 producers with production of 38,905 tons in favor, and 21 producers, with production of 25,992 tons (including 11,800 tons belonging to American producers), against the proposals.

The Council of the Rubber Growers' Association, meanwhile, adopted the proposals by a practically unanimous vote, and the Dutch and British Government are now to be approached with the view of securing restriction. The British Government, it is understood, will intervene if the Dutch Government does, but what the latter is likely to do is most uncertain. In fact, in Holland it is considered improbable that the government will change its policy, which has been one of non-intervention. According to a report in the *Financial Times*, a very pessimistic tone prevails in Amsterdam, partly for this reason and partly because the smaller companies now realize that several of the larger companies have such enormous financial reserves at their disposal that they can face even worse conditions with practical equanimity. The opinion seems rapidly to be gaining ground that the predictions of several insiders regarding the upshot of the situation—that there will be all-round concentration and amalgamation and the survival of the fittest—will be realized.

The London *Rubber Age* is also pessimistically inclined. It calls attention to the American vote against the Liaison Committee's proposals and says: "The Americans have always seen their opportunity in the troubles of the European producers. . . . If the price of rubber can be forced down to the point where shares and estates will be thrown on the market . . . . the Americans will be only too ready to relieve present owners of bad bargains at knock-out prices. That happened nine years ago, and it will happen again unless the plantation interests find a way out of their embarrassments."

After enlarging on the gravity of the situation to both consumer and producer, the paper in question points to another possibility that should give consumers food for thought, and that is that rubber might pass into the hands of the natives.

Native rubber is also the rock against which all hopes for stabilizing rubber may be broken. A writer in the *Financial Times*, after stating that native rubber will in due course lead to the extinction of estate rubber, says:

"In view of these facts . . . . is it not time the governments concerned faced the position boldly and prohibited the cultivation of rubber by the small native holders?

"Briefly, my argument is to eliminate the small holder by legislation and then introduce a generally accepted restriction scheme. Only by these means can the rubber industry be protected and assisted to better times. The alternative is survival of the fittest, and in the long run the fittest is sure to be the native smallholder."

Restriction and Valorization

In September, 1928, just before the withdrawal of the Stevenson restriction scheme, a valorization plan was presented to the Dutch and British governments as well as to the rubber organizations in Holland and England. Although the governments concerned were considerably interested, the scheme fell through because of lack of actual cooperation between British and Dutch. But now this has changed; British and Dutch are ready to cooperate, and consequently one of the originators of the 1928 valorization proposals, Mr. Van de Tas, in a recent issue of the *Financial Times* outlines a revised scheme embodying simultaneous restriction and valorization.

If valorization is adopted, only a mild form of restriction is necessary, and this should take the form of one week's tapping prohibition every month so long as the price of rubber was under 9 pence per pound. If rubber went over this figure and continued higher for three consecutive months, this would be altered to one week's tapping prohibition in three months. The tapping prohibitions would be entirely withdrawn when rubber was over 1 shilling per pound, the measure to come into effect again as soon as prices dropped. Government support, of course, would be required.

The valorization scheme would require the establishment of two valorization banks, one in Holland and one in England. Their functions would be:

To absorb all excess rubber at production cost as long as the price is under 9 pence.

When the price is over 9 pence, they will take over from producers only enough rubber to raise the price to 1 shilling 3 pence.

Their purchases will enable the banks to subsidize new industries by selling to manufacturers at a guaranteed minimum price.

The banks would be financially interested in such subsidized industries and would profit considerably. In this way their losses caused by selling raw material at a low minimum would be offset.

With considerable stocks always in hand the banks would be in a position to prevent any undue raising of prices by speculators.

A French Restriction Plan

The *India Rubber Journal* has received a detailed scheme for the control of rubber from Dr. Bernstein, of Paris. Briefly, this could only be carried out with the aid of the governments concerned and consists of placing a substantial export duty on all rubber exported from the producing countries, including native rubber. Producers would then be invited to restrict to a certain percentage, say 70 per cent of 1929 output. Those who restricted would receive from a central fund into which the proceeds of the export duty would be paid a bonus corresponding to the amount of restriction practised by them. Thus if all producers restricted, which is not expected, they would pay say 2 pence per pound on 70 per cent exported and receive a refund of 4 pence per pound on the 30 per cent of their crop not produced. Those who did not restrict would have to pay the export duty without any refund. Proceeds from this source would be available for the general purposes of the scheme for increasing the bonus to restrictors or for purchasing a stock of rubber to be kept for stabilizing purposes.

If such a stock is acquired, the rate of restriction would be kept pegged until the whole stock was disposed of, and the fund would become available for return to producers or for other uses.

Dr. Bernstein points out that by his scheme no one would have cause to complain. Those who adopted restrictions would do so because it suited them and those who wished to produce to capacity would just pay the decided amount of export duty for the privelege of selling in a market from which the others had partially retired. Consumers would have the assurance that the industry would not be sacrificed to insane competition but would be kept in working order.

Rubber Roadways

In the course of his speech at the fifteenth annual general meeting of Rubber Roadways, Ltd., held recently in London the chairman, Sir Stanley Bois, called attention to the reduction in cost of rubber paving. While a few years ago first cost was placed as high as £5 per square yard, last year a scheme of finance was propounded on a basis of £4 per square yard. As a result of intensive experiment and investigation, however, one firm had found it possible to market a rubber paving block at a price between £2 10 shillings and £3. As a mile of rubber roadway 45 feet wide will absorb some 250 tons of crude rubber, the commercial exploitation of properly tested paving blocks is of considerable importance to producers, he pointed out. The price just mentioned brings the rubber paving block into competition with granite.

Institution of the Rubber Industry

The Institution of the Rubber Industry has now decided upon a special subscription of $4 to their Bulletin for members of the Rubber Division of the American Chemical Society, and it is felt that this arrangement will go a long way toward bringing members of the two organizations together.

Arrangements for the visit of the Rubber Division to London about June 1, 1931, are now being made by the Institute of the Rubber Industry. A sub-committee consisting of the following has been appointed to take care of the details: S. S. Pickles, chief chemist, Geo. Spencer, Moulton & Co., Ltd.; D. F. Twiss, chief chemist, Dunlop Rubber Co., Ltd.; P. Schidrowitz, consultant; B. D. Porritt, director, Research Association of British Rubber Manufacturers; Herbert Rogers, director, Northern Rubber Co., Ltd.; C. B. Copeman, director, *The India Rubber Journal*.

An invitation extended by the Rubber Division of the American Chemical Society to attend its autumn meeting to be held on September 5, 1932, has been accepted on behalf of the members of the Institution of the Rubber Industry. The Council, through the Papers Committee, has appointed a sub-committee consisting of S. S. Pickles, D. F. Twiss, B. D. Porritt, and P. Schidrowitz to make arrangements for this visit. The whole trip, including travel, will occupy about a month.

Revertex, Ltd.

K. D. P., Ltd., owners of the British rights of the Revertex patents, are to change their firm name to Revertex, Ltd., it is learned. The existing company known as Revertex, Ltd., which has never done any business but was merely registered as a measure of precaution, will therefore have to be wound up. As is known, Messrs. W. Glur & Co. have charge of the sales of Revertex products.

GERMANY

Rubber Statistics

The consumption of crude rubber in Germany during the first half of 1930 showed a slight decline compared with the corresponding period of 1929. In the period of January-June 1930, crude rubber imports came to 272,788 quintals, valued 42,233,000 marks, and in 1929 to 291,394 quintals, valued 57,717,000 marks. Reexports were 23,799 quintals in 1930 against 18,171 quintals in 1929, so that if stocks are left out of consideration, the net consumption of crude rubber during the periods under consideration were 249,029 quintals, valued 38,339,000 marks, and 273,223 quintals, valued 54,062,000 marks, respectively.

Exports of German rubber manufactures, on the other hand, advanced slightly in the half year of 1930 as compared with 1929, and we find soft rubber goods exported to an amount of 105,943 quintals, valued 53,273,000 marks, against 105,276 quintals, valued 58,403,000 marks; while hard rubber goods exported were 6,269 quintals, valued 5,764,000 marks, against 6,159 quintals, valued 6,279,000 marks. The total exports were 112,212 quintals, valued 59,037,000 marks, in 1930 and 111,435 quintals, valued 64,682,000 marks, in 1929. It is to be noted that the increase applies to the quantities only; while the values show a decrease of at least 10 per cent.

Imports of rubber goods into Germany continue to show what to German manufacturers must be a gratifying decline, the figures for 1930 having been 39,550 quintals, valued 19,852,000 marks; while in the 1929 period they had been 44,248 quintals, valued 22,271 marks.

Elastic Tires Prohibited

In March, 1928, a law was passed in Germany forbidding the use of solid tires on motor vehicles, whereas the elastic hollow tires could be retained. But now a new law has been passed, whereby from July 15 all motor vehicles must be supplied with pneumatic tires except tractors which cannot exceed 16 kilometers per hour on a level road, and vehicles used by the street cleaning department. These may use elastic hollow tires. In addition, special permission will be given for the use of these tires on motor vehicles belonging to the police and fire departments; for electric and benzine cars, for 2-axle 4-ton trucks. Where these tires are still employed, the pressure on 1 cm. of the width of the felloe (base of the rubber tire) may not exceed 100 kilograms.

AUSTRIA

The report of the Semperit Oesterreichisch-Amerikanische Gummiwerke A. G., which has just been issued, shows that in spite of difficulties caused during the past year by the unfavorable weather, the concern and its auxiliaries obtained the largest turnover ever recorded since the existence of the works, that is as far as quantity is concerned. The actual profits booked, however, were not commensurate with the unusually large turnover. Overproduction in the rubber manufacturing centers all over the world, the American crisis, and last but not least, the inadequate protection given by the Austrian import duties, which have permitted the country to be flooded with foreign goods, have forced prices down to a very low level, much lower than the decline in the prices of the raw materials warranted.

The present Austrian duty on footwear, it is explained, averages 10 per cent on the value and forms no real barrier against foreign goods; similarly the duty, imposed according to weight, on bathing accessories does not prevent foreign countries from successfully competing in Austria with locally produced goods; while these same countries effectually bar Austrian goods in their own territories. The need for earnest agitation for a change in the tariff policy, therefore, is urgent. As though all this were not enough, terms of payment have taken a still more unfavorable development, and collections in Austria as well as in the countries where the firms are established, have become still more difficult.

However, the firm was able to make headway and despite foreign competition has succeeded in considerably increasing its share of the tire trade in Austria and also abroad.

The profits for the year came to 2,202,453.10 schilling; a dividend of 5 per cent was declared in addition to a super dividend of 5 per cent.

RUSSIA

Russian Crude Rubber Imports

The Rubber Division, Department of Commerce, uses two sources for Russian crude rubber import figures in preparing tables of world rubber absorption: namely, figures from the Bulletin of the Rubber Growers' Association, and Soviet statistics of imports as these become available. Over a reasonable period of time such statistics should represent the actual absorption of Russia. The two sets of statistics for the first five months of 1930 follow:

1930	R.G.A Bulletin Exports to Russia Long Tons	Official Soviet Russian Imports Long Tons
January	2,292	826
February	2,128	2,705
March	948	168*
	5,368	3,699
April	949	†
May	1,689	†

* Preliminary figure. † Not available.

The Rubber Industry in the Far East

NETHERLANDS EAST INDIES

Planters' Congress

The annual planters' congress was held at Bandoeng under the auspices of the Soekaboemische and Rubber Planters Association. In opening the congress the chairman, H. J. van Holst Pellekaan, touched on the inadequacy of the May tapping holiday and said that the situation could be improved if legislation could be obtained to forbid Sunday tapping and the working up of lower rubber grades. Thus a permanent reduction of 15 per cent could be brought about in the crop, but only on condition that an international regulation could be made by the governments concerned.

But this is not enough. Costs must be reduced as speedily as possible and drastic economy practiced in every department. He questions whether it is not time that the tradition of sheets as handsome as pictures, crepe as white as paper, and plantations like parks, were broken with.

Planting Experiences

The well-known planter, Van der Hoop, had much to say at the congress about his experiences with old planting material and up-to-date material. He gives an interesting instance of what proper treatment did for a piece of land that had become so poor that not even lalang would grow on it. But a suitable drainage system, terracing, and loosening up of the soil worked wonders, so that yields are now among the best on the whole estate.

The unusual fact was discovered that whereas the seedlings of a certain selected mother tree gave good yields, the output from the buddings from the same tree were poor. In this case, apparently, the seedlings had inherited the yielding capacity of the mother tree, while the buddings had not.

Planting Distances

Van der Hoop considers that the number of buddings per bouw (1.75 acres), recommended by the Experiment Station, from 200 to 350, is far too high. He would modify these figures as follows: Plant 30 per cent more trees than the number to be retained and find that number between 150 and 220 trees, for buddings, according to the circumstances of soil and situation.

For seedlings, when stumps of selected seeds are planted that have been thinned out 50 per cent in the nursery, the maximum number is between 170 and 220 trees per bouw.

The reason for this lower figure as compared with that indicated by the Proefstations, is that the good yielders were in most cases large trees with many branches. Figures were recorded that showed that more than half the output on certain areas came from this type of tree. Since the best trees from which mother trees have been selected are therefore those of largest girth and many branches, which take up more room, it stands to reason that their offspring will require more room too.

Results of Tapping Holiday

According to figures supplied by the Central Bureau of Statistics at Batavia, the output of 443 rubber companies fell from 8,951 metric tons in April to 607 metric tons in May.

There was a marked decrease in the June shipments from all rubber centers in the Netherlands East Indies, the totals for that month having been 19,448 tons against 25,473 tons in May. Of these totals, 9,791 tons against 12,251 tons consisted of wet rubber. The exports for the first six months for all the Netherlands East Indies are given as 79,319 tons estate rubber and 52,392 tons, dry weight, native rubber, showing decreases of 4,452 and 2,227 tons respectively as compared with the same period in the preceding year.

N. E. I. Notes

The Sumatra Rubber Co., a leading Dutch rubber concern, announces net profits of £30,000 against £57,000 last year. Whereas a dividend of 10 per cent was turned out last year, no dividend will be paid this year.

The Netherlands India Rubber & Coffee Plantation Co. lowered its dividend from 15 per cent last year to 10 per cent. The net profits decreased from £42,000 to £41,000.

MALAYA

Rubber Goods Factories

One of the many suggestions for righting the rubber situation would have the Rubber Growers' Association form a company to manufacture surplus rubber and flood the market with cheap manufactured articles. Rubber flooring and tiles are two such articles named. It is suggested that the first factory should be put up at Singapore. The majority of estates would join such a company and guarantee it a fixed percentage of their rubber at, say, 5 pence a pound for a given period, as any profits would be paid out to the estates in proportion to the amount of rubber sent in for manufacture.

Whether the Rubber Growers' Association would embark on an enterprise in competition with European and American manufacturers is extremely doubtful, but the scheme is interesting, although the idea of erecting rubber factories in Malaya is not new. About three years ago, the *Malayan Tin and Rubber Journal* urged the big tire makers like Dunlop to look into the possibility of establishing factories in Malaya, and the vicinity of Ipoh was mentioned as a particularly suitable place for such factories because of the comparatively cheap power obtainable from the Perak River Hydro-Electric Power Co. But manufacturers in England have not taken kindly to the idea, the chief objections being that rubber tires cannot be produced in the tropics.

In reply it may be argued that if Tan Kah Kee can make tires, others can too. It is, however, a surprising fact that outside of this Chinese firm and a small factory for making rubber mats, run by E. A. Hodges, ventures in rubber manufacturing in Malaya have not proved financially successful.

Tan Kah Kee started in a small way, and his rubber manufacturing has been successful. Now this enterprising Chinese is starting a selling campaign for his shoes in Europe. He has already appointed agents in London and Germany and now plans to put rubber-soled shoes on the European market at the low price of 1 shilling 6 pence and 2 shillings per pair.

This moves the *Malayan Tin and Rubber Journal* to say, "We cannot help wondering what the big rubber goods manufacturers of Europe will say to this invasion of their territory by a rival manufacturer located in Singapore. Will they now realize they have 'missed the bus' in not organizing factories in Malaya, where the raw rubber is produced and where labor is cheap?"

Rubber Research Institute

The annual report of the Board of the Rubber Research Institute of Malaya for 1929 indicates that among the questions occupying planters there, is the important one of reconditioning the soil. Owners of a number of very poor areas sought advice on manuring and rejuvenation. The only solution on such bad areas, it seems, is to endeavor to establish a cover crop and to allow the land to recover and the soil to be rejuvenated at the least cost. Oddly enough, the advice is given to replant the *worst* areas with budded material which, it is said, "clears the way for thorough conditioning." The idea, of course, is that where it would be uneconomical to spend money on manuring ordinary trees on poor soil, it would pay to do this in the case of high yielding budded areas.

Selection Experiments

At the Experiment Station, a clone trial block of 40 acres was planted with nine of the best known clones with the intention of making a comparison of the yielding capacity of these clones and also to obtain

data enabling a comparison to be made with results obtained from the same clones planted throughout Malaya on varying soil types.

A start has also been made with the selection of high yielding mother trees from 58 estates for future planting, since it is obvious that there must be in Malaya material equal to if not superior to the best clones from either Java or Sumatra. Only a few trees from each estate will be selected, from which the yield records are at least five times the average of the trees in the particular field from which they are selected. It is hoped to use bud wood from these trees at the next planting season, and a block has been reserved for this purpose at the Experiment Station.

During the period under review, the following amounts of selected planting material were imported from the Netherlands East Indies: Budwood, 142,000 meters, budded stumps, 119,400, and special seeds, 938,200. These figures are approximate.

Hevea Diseases

No new diseases of importance were reported during the year, says the report. Conservative methods of tapping during recent years have considerably reduced the incidence of Brown Bast.

Concern is expressed over a severe outbreak of *Oidium Heveæ*, the mildew fungus which causes abnormal leaf fall. This is ascribed to the prolonged dry period during refoliation. There is considerable cause for apprehension, says the report, since it is possible that with the lapse of time the fungus may become more adaptable to the host. It should here be mentioned that although the disease has been present in Malaya for the past three or four years, it has so far not caused very severe damage, and no undue reductions in crop has been noted.

Rubber Preparation

Inquiries from estates regarding the preparation of smoked sheet, indicate the greater difficulty of preparing a high quality product to meet the market requirements, which in the present period of low prices are likely to be particularly stringent. The manufacture of sole crepe is carried out by a number of estates, and the Malayan product is in good demand. At present it brings about 8 pence per pound premium over the market price of standard smoked sheet and pale crepe.

Reducing Wages

Now economy is the watchword on all estates, and costs are being cut down to the utmost. While prices have reached the lowest level in the history of rubber, the wages of the Tamils are higher than ever before. It is but fair that the coolies should share in the general decrease in incomes. The alternative to a cut in wages would be large scale dismissal of labor which might eventually lead to the displacement of the Tamil as an estate laborer in favor of the Chinese. Normally the Chinese is too expensive, demanding, as he does, $1 a day, but now with thousands of unemployed in the colony, he is quite ready to work for 50 cents a day, which is the scale enjoyed by the Tamil male worker.

Planters have therefore approached the government with a request to reduce the standard wage scale of Tamils from 50 cents for men and 40 cents for women per day, to 40 and 30 cents, respectively, with every likelihood that this will be done. Since it is figured that with costs of production at 20 cents (Straits currency), labor charges represent about 50 per cent of the expenses, a cut as indicated above, which would average over 20 per cent, would make a considerable difference to estates.

Malayan Notes

The whole proceeds of the debenture issue of the Lower Segama Rubber Estates have been exhausted and the company is entirely in the hands of the debenture holders, who have been asked to cooperate with the board with a view to disposing of the estate to best advantage as a going rubber concern.

The Bangawan Rubber Co., has only sufficient funds to carry on for a short time; consequently the directors propose that the company be liquidated and a new company be formed to take over the liabilities and assets. The company, which was formed in 1909, has paid no dividend since 1926.

The Pahi Plantations, with planted area of 995 acres in Kelantan, will be closed down, only a skeleton labor force being maintained.

The Government of Johore has decided not to consider any more applications for the alienation of land for rubber cultivation in that state.

CEYLON

Fractional Coagulation

Owing to the demand for pale sole crepe, fractional coagulation, in which the bulk of the coloring matter in the latex is removed with the first fraction, leaving a second fraction of very light color, is extensively practiced in Ceylon. It has been suggested that estates having difficulty in obtaining standard crepe sufficiently light to satisfy the market, might adopt this coagulation method employed by the sole crepe factories.

The first fraction amounts to about 10 per cent of the whole and sells at nearly 1 pence per pound less than standard crepe, on account of its dark color. In order to compare the properties of the first and second fractions as regards vulcanization, plasticity, and market grading, the Rubber Research Scheme of Ceylon sent samples to the Imperial Institute for examination.

The London Advisory Committee of the Scheme submitted the samples to a firm of London brokers whose report indicates that it will be difficult to obtain a premium for the pale second fraction and that although the intrinsic qualities of both fractions are the same, the dark fraction will get a lower price than the pale.

However, it was thought that if it could be shown that either or both fractions were specially suited for definite manufacturing purposes, it might be possible to interest manufacturers in the method, thus creating a special demand which would later on be reflected in an increased price.

The results of the examination of the London Staff of the Scheme showed that of the three samples submitted: control, first fraction, and second fraction, the first or dark colored fractions vulcanized in a little over half the time of the control sample and of the second fraction. The second fraction vulcanized a trifle faster than the control, but the difference is of little practical importance.

All three samples have a good tensile strength, but the first fraction maintains a good tensile strength over a much wider range of cures than the other samples, regard being paid to the relative rates of cure.

There is little difference between the aging properties of the second fraction and the control sample. The aging properties of the first fraction, however, are superior because it retains its tensile strength for a longer period.

There was little difference in the plasticity of the three samples.

Thus, though the first fraction crepe might be regarded as inferior to the others not only because of its dark color but because it is a less pure form of rubber, containing more non-rubber accessory substances, yet it is the presence of these very accessory substances that enables the rubber to maintain good tensile strength over a wide range of cures and for a long aging period.

Removal of Export Duty

An influential deputation of rubber growers waited on the Acting Governor, urging the removal of the duty on rubber. The reply was that such relief could not be given unless the new income tax proposals were passed by the Legislative Assembly.

Up to the present there has been no such direct taxation in the colony, and the income tax is proposed for the purpose of meeting current expenditures.

Under present conditions it is felt that if no relief is forthcoming but instead growers would be saddled with an income tax, estates would have to close down and there would be no income to tax.

Rubber Shipments

A decrease was noted in the exports of rubber from Ceylon during the first six months of 1930 as compared with 1929, the comparative figures being 83,047,576 and 85,168,511 pounds, respectively. Shipments to the United States dropped slightly from 55,738,657 in 1929 to 55,226,103 pounds in 1930. A similar decrease is also noted in the exports to France, 2,129,490 pounds instead of 2,206,374 pounds. Those to Germany, however, dropped by almost half as the figures show 2,475,875 pounds in 1930 instead of 4,171,057 pounds in 1929. Exports to the United Kingdom rose from 16,460,140 to 17,348,250 pounds.

Rubber Patents, Trade Marks and Designs

Machinery

United States

1,767,246.* **Tread Building Machine.** A mechanism adapted continuously to build up extruded tire tread rubber stock by applying breaker fabric and cushion rubber to it in step with the stock issuing from the extruding machine. A. R. Krause, Eau Claire, Wis., assignor to Gillette Rubber Co., a corporation of Wis.

1,768,345.* **Inner Tube Repairer.** This embodies an electrically heated press unit for making any size vulcanized repair from a nail hole to a long tear, in which the heat can be localized at the repair. The upper section of the press is a single plate electrically heated and controlled; while the lower section comprises a series of presser plates arranged to be pressed independently against the heated plate by determinate pressure. J. C. Thomas and W. H. Bines, assignors to Firestone Tire & Rubber Co., all of Akron, O.

1,768,365.* **Cut-off Device.** Materials forced from die expressing or extruding machines are cut off by utilizing a set of rotatable knives movable across the extrusion orifices of the machine. W. C. MacFarlane, Kenmore, assignor to Xylos Rubber Co., Akron, both in O.

1,768,589.* **Tube Forming Machine.** By this invention an endless tube is formed by means of an external mandrel or mold holding the sheet rubber to the form of the mandrel or mold by a fluid pressure difference until the edges of the rubber are joined. T. L. Fawick, Racine, Wis.

1,768,671.* **Tubing Machine.** This provides a core and die structure by which the flow of the material being extruded is regulated so as to eliminate the weaknesses and imperfections by obliterating the separations occasioned by the spokes of the core bridge and thus improve the product.

* Pictured in group illustration.

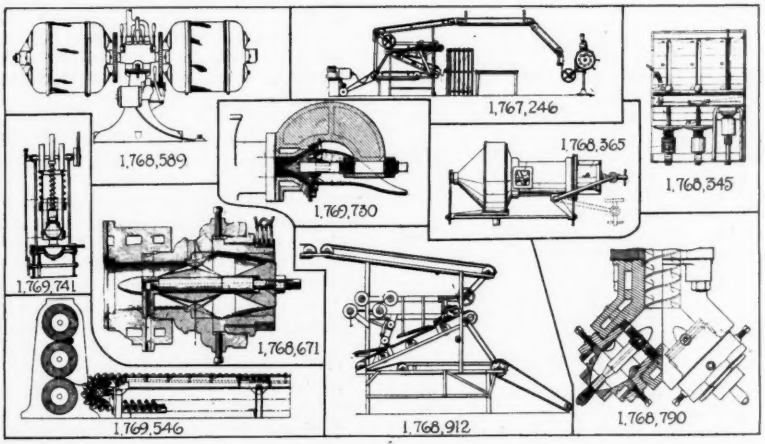
J. W. Devine, New Brunswick, assignor to V. Royle, Paterson, both in N. J.

1,768,790.* **Extruding Machine Head.** This improvement in heads for tubing machines comprises a device so constructed as to enable the ejection of tubed or strained material through two outlets by the action of a single screw or prodder. The chamber of the head immediately in advance of the screw is flared forwardly or outwardly on lines substantially parallel with the longitudinal axes of the outlets. V. Royle, Paterson, N. J.

1,768,912.* **Tread Forming Machine.** A tread stock building machine in which an improved stitching mechanism is provided to apply breaker and cushion stock to the irregular surface of a strip of tread stock. These added layers of breaker and cushion stock are progressively stitched by individual stitching wheels contacting first at the center and progressively working out to the edges of the material. A. R. Krause and H. O. Hutchens, assignors to Gillette Rubber Co., all of Eau Claire, Wis.

1,769,546.* **Strip Conveyer.** An endless conveyer having variable speeds in different regions of its structure and a pair of parallel chains carrying bars for supporting the material being conveyed. The variability of the conveyer's rate of travel is affected by the novel construction of the links of the chains. Adjacent links are moved toward or away from each other in local zones of the conveyer by cam means embodied in the links. R. V. Ritchey, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

1,769,730.* **Extruding Machine Head.** In this invention the core for forming the hole in an extruded tube is supported externally. The core support is a curved beam formed integrally with the head member. A portion of the beam extends into alinement with a central opening in the head, and supports a core which coöperates with the head in forming a tube, thus dispensing with spiders or like devices which tend to cause zones of weakness in the extruded product. L. Wetmore, assignor to Goodyear Tire & Rubber Co., both of Akron, O.



1,769,741.* **Hollow Ball Machine.** A machine that takes in a length of unvulcanized rubber and cuts it into pieces of proper size and transforms them into hemispherical segments ready for formation of hollow balls. To remove the segment from the mold means are provided for slanting the mold so that the segment may be easily detached from it. K. Kurokawa, Shimonoseki, Japan.

1,766,198. **Tennis Ball Reconditioner.** R. H. Smilie, Oakland, Calif.

1,766,333. **Tire Repair Instrument.** T. H. Forehand, Nashville, Tenn.

1,766,727. **Compound Tool.** C. W. Steele, assignor to Miller Rubber Co., both of Akron, O.

1,767,062. **Inner Tube Mold.** A. A. Glidden and T. M. Knowland, both of Watertown, Mass., assignors, by mesne assignments, to Hood Rubber Co., Inc., Wilmington, Del.

1,767,288. **Flat Tire Builder.** E. Hutchens, Milwaukee, assignor to Utility Mfg. Co., Cudahy, both in Wis.

1,767,682. **Repair Vulcanizer.** J. L. Kelly, Los Angeles, Calif.

1,768,093. **Mechanical Mold and Trimmer.** J. M. Andre, Montello, Mass.

1,768,190. **Winding Machine.** A. E. Collins, Cuyahoga Falls, O., assignor, by mesne assignments, to Miller Rubber Co., Inc., Wilmington, Del.

1,768,327. **Inflation Apparatus.** G. B. Nichols, assignor to Firestone Tire & Rubber Co., both of Akron, O.

1,768,328. **Tube Puncher.** G. B. Nichols, assignor to Firestone Tire & Rubber Co., both of Akron, O.

1,768,332. **Fabric Band Expander.** R. V. Ritchey, assignor to Firestone Tire & Rubber Co., both of Akron, O.

1,768,335. **Tire and Airbag Washer.** H. D. Stevens, assignor to Firestone Tire & Rubber Co., both of Akron, O.

1,768,336. **Tube Polisher.** H. D. Stevens, assignor to Firestone Tire & Rubber Co., both of Akron, O.

1,768,337. **Airbag Coating Device.** H. D. Stevens, assignor to Firestone Tire & Rubber Co., both of Akron, O.

1,768,338. **Wrapping Machine.** W. C. Stevens, assignor to Firestone Tire & Rubber Co., both of Akron, O.

1,768,339. **Mandrel Polisher.** W. C. Stevens, assignor to Firestone Tire & Rubber Co., both of Akron, O.

1,768,340. **Strip Applying Device.** W. C. Stevens, assignor to Firestone Tire & Rubber Co., both of Akron, O.

1,768,341. **Tire Builder.** W. C. Stevens, assignor to Firestone Tire & Rubber Co., both of Akron, O.

1,768,349. **Temperature Controller.** R. W. Brown, assignor to Firestone Tire & Rubber Co., both of Akron, O.

1,768,406. **Vulcanizer Fluid Conductor.** W. E. Humphrey and T. G. Graham, assignors, by mesne assignments, to

Mason Tire & Rubber Co., all of Kent, O.

1,768,590. **Mold.** T. L. Fawick, Racine, Wis.

1,768,639. **Gage.** A. F. Shore, New York, and W. F. Shore, Freeport, assignors to Shore Instrument & Mfg. Co., Jamaica, all in N. Y.

1,769,187. **Strip Cutter.** H. I. Morris, Lakewood, assignor, by mesne assignments, to Yoder-Morris Co., Cleveland, both in O.

1,769,404. **Tire Builder.** N. L. Warner, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

1,769,421. **Tire Builder.** J. H. Doty, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

1,769,703. **Conveyer Belt Mechanism.** E. F. Maas, assignor to Goodyear Tire & Rubber Co., both of Akron, O.

1,769,714. **Rubber Trimming Machine.** E. D. Putt, assignor to Firestone Tire & Rubber Co., both of Akron, O.

1,769,720. **Rimming Press.** R. W. Snyder, assignor to Goodyear Tire & Rubber Co., both of Akron, O.

1,769,728. **Inner Tube Skiving Clamp.** J. C. Warden, assignor to Goodyear Tire & Rubber Co., both of Akron, O.

1,770,531. **Cord Tire Making Device.** A. E. Preyer, Washington, D. C.

1,770,655. **Vulcanizing Soles to Uppers.** F. Nielsen, Epping, near Sydney, N. S. W., Australia.

Dominion of Canada

301,678. **Pressure Bag Remover.** Firestone Tire & Rubber Co. of Canada, Ltd., Hamilton, Ont., assignee of W. C. Stevens, Uniontown, O., U. S. A.

301,679. **Tubing Machine.** Firestone Tire & Rubber Co. of Canada, Ltd., Hamilton, Ont., assignee of R. D. Wilhelm and L. C. Riblert, both of Akron, O., U. S. A.

301,720. **Tube Vulcanizer.** National Rubber Machinery Co., assignee of O. J. Kuhlke, both of Akron, O., U. S. A.

301,849. **Uniformity of Dispersions.** Anode Rubber Co., Ltd., Guernsey, Guernsey, assignee of P. Klein and S. Gotleb, both of Budapest, Hungary, A. Szegvari and G. F. Wilson, both of Akron, O., U. S. A.

301,899. **Constructing Multi-Ply Articles.** Goodyear Tire & Rubber Co., assignee of F. E. Ensley, both of Akron, O., U. S. A.

301,967. **Pressing and Cutting Template.** Dr. Dorogi es Tarsa Gummigyar R. T., Budapest-Albertfalva, assignee of half interest of I. and L. Dorogi, both of Budapest, all in Hungary.

302,134. **Extrusion Apparatus.** National-Erie Co., Erie, Pa., assignee of F. C. Vandergrift, Akron, O., both in the U. S. A.

United Kingdom

328,273 and 328,274. **Making Porous Rubber.** M. Wilderman, Hampstead, London.

328,365. **Extrusion Machine.** Firestone Tire & Rubber Co., Ltd., Brentford, Middlesex. (Firestone Tire & Rubber Co., Akron, O., U. S. A.)

328,398. **Fabric Coating Device.** A. Boecler, St. Mandé, Paris, France.

328,407. **Ball Tester.** T. Cropper, Erdington, Birmingham.

329,409. **Boot Vulcanizer.** British United Shoe Machinery Co., Ltd., and F. Ricks, both of Leicester.

Germany

Designs

1,127,831. **Rubber Roughener.** Ackermann & Schmitt, Kanonenweg 214, Stuttgart 13.

1,128,710. **Vulcanizing Apparatus.** W. Bruns, Hannover.

Process

United States

1,765,774. **Insulating Paper.** R. P. Rose, Jackson Heights, and H. E. Cude, Floral Park, assignors to General Rubber Co., New York, all in N. Y.

1,766,627. **Boot Lining.** A. A. Glidden and T. M. Knowland, both of Watertown, and W. J. Duffy, Melrose, all in Mass., assignors, by mesne assignments, to Hood Rubber Co., Inc., Wilmington, Del.

1,768,933. **Hand-Grip Sleeves.** R. E. Riley, Akron, O., assignor, by mesne assignments, to Miller Rubber Co., Inc., Wilmington, Del.

1,769,943. **Rubber-Leather Vulcanizing.** L. B. Conant, Cambridge, Mass., assignor, by mesne assignments, to Standard Patent Process Corp., a corporation of Mass.

1,770,671. **Attaching Shoe Treads.** W. G. Rudolph, Hannover, Germany.

Dominion of Canada

301,449. **Retarding Rubber Deterioration.** E. I. du Pont de Nemours & Co., Wilmington, Del., assignee of W. S. Calcott, W. A. Douglass, and O. M. Hayden, all of Pennsgrove, N. J., all in the U. S. A.

301,848. **Producing Coherent Rubber.** Anode Rubber Co., Ltd., Guernsey, Guernsey, assignee of P. Klein and F. Gabor, both of Budapest, Hungary, and A. Szegvari, Akron, O., U. S. A.

301,850. **Rubber Deposition.** Anode Rubber Co., Ltd., Guernsey, Guernsey, assignee of M. Forrer, Paris, France.

301,851. **Viscous Dispersions.** Anode Rubber Co., Ltd., Guernsey, Guernsey, assignee of M. Forrer, Paris, France.

301,900. **Preparing Gas Black.** Goodyear Tire & Rubber Co., Akron, O., assignee of W. K. Lewis, Newton, Mass., both in the U. S. A.

United Kingdom

327,974. **Overshoe Waterproof Upper.** A. A. Glidden, Watertown, and W. R. Hickler, Weston, both in Mass., U. S. A.

328,015. **Coagulating Latex.** Dunlop Rubber Co., Ltd., London, R. F. McKay and W. G. Thorpe, both of Fort Dunlop, Birmingham.

328,982. **Resilient Mesh.** W. R. Wallace and A. C. Warwick, both of London.

Chemical

United States

1,765,597. **Rubber Composition.** H. E. Malone, Riverside, and R. W. Pryor, LaGrange, both in Ill., assignors to Western Electric Co., Inc., New York, N. Y.

1,765,666. **Rubber Inflating Agent.** W. Genth, Cologne-Stammheim, assignor to I. G. Farbenindustrie A. G., Frankfort-on-the-Main, both in Germany.

1,765,748. **Flooring Composition.** M. C. Teague, Jackson Heights, N. Y., assignor to American Rubber Co., Boston, Mass.

1,766,755. **Accelerator.** H. Lecher and W. Zieser, both of Leverkusen-on-the-Rhine, assignors to I. G. Farbenindustrie A. G., Frankfort-on-the-Main, all in Germany.

1,766,760. **Antioxidant.** H. A. Morton, Akron, O.

1,769,506. **Ebonite Composition.** H. Gray, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

1,769,659. **Electrodeposition of Rubber.** W. A. Williams, Edinburgh, Scotland.

1,769,717. **Rubber Emulsion.** S. E. Sheppard and L. W. Eberlin, both of Rochester, N. Y., assignors by mesne assignments, to American Anode, Inc., a corporation of Del.

1,770,092. **Latex Treatment.** S. D. Sutton, assignor to Veedip, Ltd., both of Brentford, England.

Dominion of Canada

301,666. **Grinding Wheels.** Dispersions Process, Inc., Dover, Del., assignee of W. B. Pratt, Wellesley, and H. S. Miller, Quincy, both in Mass., all in the U. S. A.

301,667. **Asbestos Fiber Sheeting.** Dispersions Process, Inc., Dover, Del., assignee of W. B. Pratt, Wellesley, and H. S. Miller, Quincy, both in Mass., all in the U. S. A.

301,668. **Fiber Rubber Sheeting.** Dispersions Process, Inc., Dover, Del., assignee of W. B. Pratt, Wellesley, and H. S. Miller, Quincy, both in Mass., all in the U. S. A.

301,889. **Antiaging Material.** E. I. du Pont de Nemours & Co., Wilmington, Del., assignee of W. S. Calcott, W. A. Douglass, and O. M. Hayden, all of Pennsgrove, N. J., all in the U. S. A.

301,965. **Shaped Articles.** Anode Rubber Co., Ltd., Guernsey, Guernsey, assignee of P. Klein and F. Gabor, both of Budapest, Hungary.

302,018. **Fibrous Product.** F. T. Lahey, Brooklyn, N. Y., U. S. A.

302,313. **Resin and Caoutchouc Solutions.** I. G. Farbenindustrie A. G., Frankfort-on-Main, assignee of C. Krauch, Ludwigshafen-on-Rhine, and M. Pier, Heidelberg, all in Germany.

302,314. **Artificial Rubber.** I. G. Farbenindustrie A. G., Frankfort-on-Main, assignee of H. Lecher, Leverkusen/Rhine, and O. Ripke, Elberfeld, all in Germany.

302,315. **Accelerator.** I. G. Farbenindustrie A. G., Frankfort-on-Main, assignee of G. Kranzlein and P. Ochwat, both of Frankfort-on-Main-Hoechst, all in Germany.

302,316. **Age Resister.** I. G. Farbenindustrie A. G., Frankfort-on-Main, assignee of E. Rietz and W. Hoffmann, both of Elberfeld, all in Germany.

302,318. **Artificial Rubber.** I. G. Farbenindustrie A. G., Frankfort-on-Main,

assignee of E. Tschunker and W. Bock, both of Koln-Mulheim, all in Germany.

United Kingdom

327,979. **Agglomerating Carbon Black.** J. E. Pollak, London. (W. B. Wiegand and L. J. Venuto, both of New York, N. Y., U. S. A.)

327,981. **Coating Composition.** Imperial Chemical Industries, Ltd., Millbank, London. (E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., U. S. A.)

328,025. **Electric Insulation.** W. S. Smith, Benchams, Devon; H. J. Garnett, Lymne, Sevenoaks, and J. N. Dean, Orpington, both in Kent; B. J. Habgood, Bournemouth; and H. C. Channon, S. Kensington, London.

328,115. **Antiager.** Imperial Chemical Industries, Ltd., Millbank, London, S. Coffey and W. J. S. Naunton, both of Blackley, Manchester.

328,686. **Latex Treatment.** Dunlop Rubber Co., Ltd., London, and D. F. Twiss, Fort Dunlop, Birmingham.

328,812. **Rubber Composition.** J. Y. Johnson, London. (I. G. Farbenindustrie A. G., Frankfort-on-Main, Germany.)

328,818. **Chlorinating Rubber.** M. Deseniss and A. Nielsen, both of Hamburg, Germany.

328,980. **Electric Deposition.** Dunlop Rubber Co., Ltd., London, R. F. McKay and E. W. Madge, both of Fort Dunlop, Birmingham.

329,000. **Synthetic Rubber.** J. Y. Johnson, London. (I. G. Farbenindustrie A. G., Frankfort-on-Main, Germany.)

329,266. **Emulsions.** A. L. Mond, London. (T. Goldschmidt, A. G., Essen, Germany.)

329,275. **Electric Insulation.** W. S. Smith, Benchams, Devon; H. J. Garnett, Lymne, Sevenoaks, and J. N. Dean, Orpington, both in Kent; B. J. Habgood, Bournemouth; and H. C. Channon, S. Kensington, London.

329,381. **Treating Latex.** Dunlop Rubber Co., Ltd., London, C. Hayes, E. W. Madge, and F. C. Jennings, all of Fort Dunlop, Birmingham.

329,456. **Accelerator.** Imperial Chemical Industries, Ltd., Millbank, London, S. Coffey, W. J. S. Naunton, and A. Shepherdson, all of Blackley, Manchester.

Germany

503,624. **Non-drying, Non-irritant Adhesive.** Louis Ritz & Co., Hamburg.

503,644. **Rubber Dispersed Hollow Articles.** Anode Rubber Co., Ltd., London, England. Represented by W. Karsten and C. Wiegand, both of Berlin S. W. 11.

503,645. **Preserving Latex.** I. G. Farbenindustrie A. G., Frankfurt a. Main.

503,646. **Dipped Goods from Latex.** Anode Rubber Co., Ltd., London, England. Represented by W. Karsten and C. Wiegand, both of Berlin S. W. 11.

503,647. **Vulcanizing Method.** W. Scott, Nitro, W. Va., U. S. A. Represented by A. Mestern, Berlin S. W. 48.

503,648. **Reclaiming with Alkali Solution.** Societa Italiana Pirelli, Milan, Italy. Represented by W. Ziegler, Berlin-Charlottenburg.

General

United States

17,714 (Reissue). **Table Cover.** C. A. Hupp, Indianapolis, assignor of one-half to W. M. Wilt, Syracuse, both in Ind.

1,765,402 and 1,765,403. **Band Saw Wheel.** A. G. Carter, assignor to Carter Products Co., Inc., both of Grand Rapids, Mich.

1,765,623. **Lather Rubber.** A. W. Schweibold, Monroe, Mich.

1,765,645. **Combination Toy.** J. P. Bauer, Jeannette, Pa.

1,765,725. **Dress Shield.** S. Imbach, Dresden, Germany.

1,765,850. **Tire Safety Pressure Gage.** E. W. Richardson, Oakdale, Calif.

1,765,858. **Wheel.** F. E. Anderson, Brooklyn, N. Y.

1,766,027. **Heel.** P. H. Letchford, Winnipeg, Man., Canada.

1,766,311. **Heel.** W. S. Shaft, assignor to Shaft-Pierce Shoe Co., both of Fairbault, Minn.

1,766,393. **Auxiliary Pneumatic Wheel.** W. R. Metts, Atlanta, Ga.

1,766,471. **Structural Material.** C. A. Van Dusen, assignor to Glenn L. Martin Co., both of Cleveland, O.

1,766,522. **Antiskid Heel.** P. H. Letchford, Winnipeg, Man., Canada.

1,766,529. **Windshield Cleaner.** C. R. Peirson, Bloomfield, N. J.

1,766,557. **Babies' Bathing Tub.** R. L. Smith, Brooklyn, N. Y.

1,766,668. **Manual Syringe.** P. M. Miller, assignor to F. R. Miller, both of Brooklyn, N. Y.

1,766,776. **Covered Elastic Strand.** L. B. Chisholm, Stoneham, assignor to Everlastik, Inc., Chelsea, both in Mass.

1,766,880 and 1,766,881. **Universal Joint.** W. A. Chryst, assignor, by mesne assignments, to Delco Products Corp., both of Dayton, O.

1,766,882. **Pivot Joint.** W. A. Chryst, assignor to Delco Products Corp., both of Dayton, O.

1,767,021. **Ball Valve.** J. W. Taylor, Cincinnati, O.

1,767,165. **Weather Stripping.** Le R. M. Bickett, assignor to Bickett Rubber Products Corp., both of Watertown, Wis.

1,767,234. **Tread Stock.** W. B. Wescott, Dover, assignor to Rubber Latex Research Corp., Boston, both in Mass.

1,767,263. **Metatarsal Arch Support.** W. M. Scholl, Chicago, Ill.

1,767,353. **Separator, Disintegrator, Mixer.** E. de Dorlodot, Paris, France.

1,767,460. **Arch Support.** G. H. Jung, Jr., assignor to Jung Arch Brace Co., both of Cincinnati, O.

1,767,501. **Cover.** C. D. Anderson, Chicago, Ill.

1,767,502. **Puncture-Proof Tire.** H. C. Anderson, New York, N. Y.

1,767,566. **Driving Clutch.** J. W. Updike, assignor to Marmon Motor Car Co., both of Indianapolis, Ind.

1,767,610. **Acoustic Apparatus.** W. J. O'Leary, Dayton, O.

1,767,722. **Boot-Top Fastener.** G. L. Van Dinter, assignor to Mishawaka Rubber & Woolen Mfg. Co., both of Mishawaka, Ind.

1,767,772. **Tire Bead Element.** R. C. Pierce, Niles, Mich., assignor to National-Standard Co., a corporation of Mich.

1,767,884. **Theftproof Tire Valve Cap.** H. Heinrich, Brooklyn, N. Y.

1,767,911. **Atomizer.** B. Berko and J. Brewer, both of New York, N. Y.

1,767,936. **Cup Washer.** J. J. McElroy and E. L. Beecher, both of New Haven, Conn., assignors, by mesne assignments, to Cleveland Pneumatic Tool Co., Cleveland, O.

1,768,048. **Tire Alarm.** L. C. Galli, Ferndale, Md.

1,768,178. **Hydraulic Force Cup.** L. R. Watson, assignor to M. & M. Sales & Mfg. Co., Inc., both of Portland, Oreg.

1,768,229. **Golf Ball Washer.** A. P. Blakemore, assignor to Katz & Blakemore, both of Philadelphia, Pa.

1,768,348. **Composite Rubber Article.** W. B. Wescott, assignor to Rubber Latex Research Corp., both of Boston, Mass.

1,768,370. **Nonskid Overshoe.** C. C. Pearson, N. Providence, and E. M. McLellan, Cranston, both in R. I.

1,768,411. **Plasterer's Paddle.** A. J. Lord, Conshohocken, Pa.

1,768,780. **Syringe.** L. F. Novak, Jersey City, N. J.

1,768,792. **Golf Club Head.** F. H. Schavoir, Stamford, Conn., assignor to Schavolite Golf Corp., New York, N. Y.

1,768,796. **Medicinal Bag.** M. B. Sleeper, assignor to Sleeper Research Laboratories, Inc., both of New York, N. Y.

1,768,873. **Automobile Tread.** G. E. Whitlock, Toledo, O.

1,768,999. **Tire Alarm.** R. L. Sim, New York, N. Y.

1,769,005. **Airplane Wing Structure.** C. A. Van Dusen, assignor to Glenn L. Martin Co., both of Cleveland, O.

1,769,032. **Teat Cup.** R. E. Maes, Chicago, Ill., assignor to International Harvester Co., a corporation of N. J.

1,769,124. **Valve Nipple Seal.** J. F. Engle, Lakewood, O.

1,769,186. **Face and Head Mask.** A. K. Morris, Atlanta, Ga.

1,769,259. **Closure Construction.** B. L. Henry, assignor of one-half to E. A. Guinzburg, both of New York, N. Y.

1,769,267. **Tire Valve.** G. A. Meek, Leon, Iowa.

1,769,328. **Bathing Sandal.** L. Auster, New York, N. Y.

1,769,427. **Tire Deflation Switch.** J. B. Garside, assignor of one-half to M. E. Neish, both of Tonopah, Nev.

1,769,482. **Bed Pan.** E. B. Allcutt, Plainfield, N. J.

1,769,500. **Lifeboat.** C. G. Fisher, Montauk, N. Y.

1,769,508. **Tire Signal.** W. A. Harned, Helena, Mont.

1,769,663. **Tire Valve and Cap.** W. H. David, Tottenville, N. Y.

1,769,694. **Tire.** R. E. Jenkinson, assignor to Goodyear Tire & Rubber Co., both of Akron, O.

1,769,945. **Wire Rope.** W. C. Erkert, Peoria, Ill.

1,769,977. **Glove.** P. H. Watkins, Leonia, N. J., assignor to Goodyear's India Rubber Glove Mfg. Co., Naugatuck, Conn.

1,770,062. **Pencil Sharpener.** C. H. Blomgren, Spokane, Wash.

1,770,076. **Washing Machine.** W. H. Kleinhammer, San Francisco, Calif.

1,770,124. **Amusement Arena.** V. Beaudette, Old Orchard, Me.

1,770,209. **Cushion Connection.** A. H. Leipert, assignor to International Motor Co., both of New York, N. Y.

1,770,313. **Tire.** F. W. Krone, San Francisco, Calif.

1,770,357. **Constructional Material.** A. C. Fischer, Chicago, Ill., assignor to Philip Carey Mfg. Co., a corporation of O.

1,770,360. **Composition of Matter.** A C. Fischer, Chicago, Ill., assignor to Philip Carey Mfg. Co., a corporation of O.

1,770,361. **Constructional Material.** A. C. Fischer, Chicago, Ill., assignor to Philip Carey Mfg. Co., a corporation of O.

1,770,426. **Finger Eraser.** W. Paris, Tallahassee, Fla., and T. P. Hill, Colorado Springs, Colo.

1,770,514. **Electrode.** W. C. Geer, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

1,770,630. **Collapsible Tube Closure.** A. E. Smith, Los Angeles, Calif.

1,770,740. **Curvilinear Elastic Fabric.** J. V. Moore, assignor to Moore Fabric Co., both of Pawtucket, R. I.

1,770,741. **Garment Supporter.** J. V. Moore, assignor to Moore Fabric Co., both of Pawtucket, R. I.

1,770,742. **Curvilinear Garter.** J. V. Moore, assignor to Moore Fabric Co., both of Pawtucket, R. I.

1,770,764. **Spraying Device.** J. A. Brooks, Detroit, Mich.

Dominion of Canada

301,464. **Pipe Coupling.** Johns-Manville Corp., New York, N. Y., U. S. A., assignee of A. Mazza, Genoa, Italy.

301,495. **Flexible Metallic Packing.** Rhodes Metallic Packing Co., Detroit, Mich., assignee of Rhodes Master Packing Co., Inc., assignee of E. B. Rhodes, administratrix of the estate of H. P. Rhodes, deceased, all of Houston, Tex., all in the U. S. A.

301,532. **Bearing.** H. Dreyfus, London, assignee of E. C. Cope and E. Kinsella, both of Spondon, near Derby, all in England.

301,762. **Resilient Tire.** C. G. Worsley, Surrey Hills, and P. L. Harkin, Carlton, co-inventors, both in Victoria, Australia.

301,809. **Tire Tread.** E. B. Killen, London, E. C. 4, England.

301,955. **Loaded Heel.** United Shoe Machinery Co. of Canada, Ltd., Montreal, P. Q., assignee of G. O'Gorman, Boston, Mass., U. S. A.

301,970. **Tire Interliner.** C. R. Hesseltine, Seattle, assignee of J. H. Patten, Kent, both in Washington, U. S. A.

301,980. **Insulating Material.** W. S. Smith, Newton Poppleford, Devonshire, H. J. Garnett, Sevenoaks, Kent, H. C. Channon, S. Kensington, London, and J. N. Dean, Orpington, Kent, co-inventors, all in England.

301,995. **Tire Inflator.** R. H. Daneel, Britstown, Cape Province, South Africa.

302,004. **Railway Buffer and Draw Gear.** R. T. Glascodine, London S. W. 1, England.

302,177. **Tire Deflation Signal.** W. L. Galbraith, Deer Park, A. W. Taylor, Spokane, and C. B. Woodard, Deer Park, assignee of one-third of the interest, all in Washington, U. S. A.

302,198. **Fastening Device.** T. B. Andre, London, W. 11, England.

302,230. **Insulating Tape.** I. W. Levine, Montreal, P. Q.

United Kingdom

327,936. **Surgical Syringe.** B. F. Crisenberry, Detroit, Mich., U. S. A.

328,022. **Tire Inflating Valve.** T. Beasley, London.

328,047. **Ball Inflating Plug.** L. E. Williams, London, and G. E. James, Bath.

328,065. **Ball Inflator.** L. E. Williams, London, and G. E. James, Bath.

328,080 and 328,081. **Ball Inflating Plug.** L. E. Williams, London, and G. E. James, Bath.

328,098. **Garment Elastic Band.** J. Chatwin, London. (Kaiser & Dicke, Kom-Ges., A. Lohsträter, W. Dicke, and P. Gronefeld, all of Barmen, Germany.)

328,135. **Electric Coupling.** F. Renyard, Clapham, London.

328,143. **Tire.** T. and J. Bialek, both of Oberglogau, Oberschl, Germany.

328,155. **Tennis Ball Game.** Henley's Tire & Rubber Co., Ltd., London, and J. Traxler, Waterfield, Warlingham, Surrey.

328,164. **Fountain Pen.** A. Mellor, Cheltenham.

328,168. **Heel.** V. Slampa, G. Sirek, and A. Klein, all of Brünn, Czechoslovakia.

328,170. **Ball Inflating Plug.** L. E. Williams, London, and G. E. James, Bath.

328,215. **Hair Waver.** A. O. Lewis, Glais, near Swansea.

328,216. **Gramophone Pickup.** Lissen, Ltd., and R. P. Richardson, both of Isleworth, Middlesex.

328,246. **Rock Drill Dust Collector.** C. Sgonina, Llanishen, Glamorgan.

328,368. **Gear Box and Motor Mounting.** F. H. Royce, Derby.

328,377. **Lifeboat Fender.** E. Jennings, Liverpool.

328,386. **Shaving Brush.** T. M. Rigby, Tarporley, Cheshire.

328,402. **Pipe Joint.** Dunlop Rubber Co., Ltd., London, W. H. Paull and W. De La R. Bond, both of Erdington, Birmingham.

328,415. **Sea Boot.** A. L. Howarth, Koranna, S. Benfleet, Essex.

328,440. **Glass Cells.** F. Livon, Levallois, Seine, France.

328,559. **Bookbinding.** A. L. Grammer, Glenside, Pa., U. S. A.

328,598, 328,599, and 328,670. **Rectal Dilators.** G. C. Marks, London. (Electro Thermal Co., Steubenville, O., U. S. A.)

328,650. **Necktie.** L. R. Holt, Menston, Yorkshire.

328,699. **Arch Supporter.** F. Bingler, Ludwigshafen-on-Rhine, Germany.

328,761. **Cable Conduit End Bush.** R. Nettl, Cheadle Hulme, Cheshire.

328,840. **Loudspeaker.** J. B. Fagan, London.

328,841. **Tire.** M. Leupold, Jamaica, L. I., N. Y., U. S. A.

328,894. **Hockey Stick.** P. W. Griffin, Enfield, Middlesex.

328,921. **Compound Fabric.** S. C. Caddy, Sutton, Surrey.

329,002. **Rotary Printing Machine.** T. H. David and F. B. Lawton, both of Cardiff.

329,016. **Toy Animal.** W. G. Grant, Chatham.

329,021. **Brake Lining.** J. E. Pollak, London. (Rubber Latex Research Corp., Boston, Mass., U. S. A.)

329,026. **Vehicle Body Frame.** W. H. Holland, Greenock, and J. Cooper, Inchinnan, Renfrewshire.

329,141. **Mat.** S. C. Icke, Salop, and C. A. Daniel, Birmingham.

329,164. **Fountain Pen.** W. Livsey, Wallasey, Cheshire.

329,262. **Artificial Fishing Bait.** H. Readman, Woodville, Berwickshire.

329,338. **Wheel.** F. W. Baker, Oldswinford, Worcestershire.

329,374. **Brake.** A. W. Cattermole, New Barnet, Hertfordshire.

329,401. **Pipe Joint Tester.** F. L. Ball, F. Moulton, and Lead Wool Co., Ltd., all of Snodland, Kent.

329,434. **Cloth Expander.** E. Farrell, Salford, Manchester.

329,447. **Electric Switch.** L. Barrett, Cambridge.

329,450. **Garment Supporting Belt.** I. B. Kleinert Rubber Co., assignee of V. Guinzburg, both of New York, N. Y., U. S. A.

329,470. **Goggles.** G. D. Clothier, Newcastle-on-Tyne.

329,486. **Tennis Racket Hand Grip.** S. Surridge & Co., Ltd., and P. Surridge, both of London.

329,497. **Railway Buffers.** G. Spencer, Moulton & Co., Ltd., and J. C. Spencer, both of Westminster.

329,505. **Tire Pressure Gage.** W. Turner, Sheffield.

Germany

502,307. **Ball with Voice.** O. Schellwat, Tilsit.

502,885. **Raised Soft Rubber Rimmed Earphone.** Dr. Heinr. Traun & Sohne vormals Harburger Gummi-Kamm-Compagnie, Hamburg, 8.

503,013. **Artificial Foot.** J. Loth, Koslin, Pomm.

503,261. **Tire, also for Use as Belt.** N. Gherassimoff, Asnières, and E. Rivoche, Paris, both in France. Represented by P. Breitenbach, Dusseldorf.

503,460. **Patch.** H. Beerens and S. Kraut, Jr., Meissen.

Designs

1,126,371. **Brush.** Welt-Wachs-Werk Egbert Gunther Sohne, Dresden A-19.

1,126,777. **Hair Confiner.** K. Gebser, Arnstadt i. Th.

1,126,853. **Typewriter Key.** H. Frederking, Berlin-Rudow.

1,127,035. **Conveyer Edge Protector.** F. Clouth, Rheinische Gummiwarenfabrik A. G., Koln-Nippes.

1,127,366. **Cosmetic Brush.** P. Schuster, Kirchlengern.

1,127,749. **Hanger for Measuring Instruments.** Allgemeine Elektricitats Gesellschaft, Berlin N. W. 40.

1,127,792. **Shoe for Furniture Legs.** K. Schubert, Herne, and L. Schubert, Mulheim-Styrum.

1,127,925. **Rubber Soled Shoe.** Harburger Gummiwarenfabrik Phoenix, A. G., Harburg a. d. E.

1,128,216. **Rubber Covered Brush.** E. and N. von Recsey, both of Berlin-Grunewald.

1,128,267. **Sport Apparatus.** A. Birk and K. Stock, both of Dusseldorf-Gerresheim.

1,128,828. **Crepe Rubber Brush.** O. Press, Cronberg i. Taunus.

1,128,839. **Heel.** H. Bendisch, Dortmund.

1,128,921. **Overshoe.** O. Herfeld, Zurich, Switzerland. Represented by E. Moldenhauer, Dusseldorf.

1,129,069. **Hammer.** Continental Gummi-Werke A. G., Hannover.

1,129,097. **Crepe Rubber Shoe.** M. Theilmann, Frankfurt a. M.-Niederrad.

1,129,456. **Nipple.** Schwalenberg & Schumacher, Dusseldorf.

1,129,582. **Closure.** W. Baier, Dresden-A.

1,129,729. **Floor Covering.** Thuringer Schlauchweberei & Gummiwerk, Waltershausen.

1,129,824. **Belt with Rubber Insert.** A. Hensel, Hindenburg, O.-S.

1,130,001. **Sponge Rubber Cushion.** Masonia Rubber Works G. m. b. H., Wandsbek.

Trade Marks

United States

271,958. **Duplex.** Heel pad and hose protector. S. B. Wright, doing business as Wright Products Co., Chicago, Ill.

271,993. **Town-ease.** Footwear. H. W. Hanan, doing business as Hanan & Son, Brooklyn, N. Y.

272,007. **Saxone.** Footwear. Saxone Shoe Co., Ltd., Kilmarnock, Scotland.

272,016. **Whitex.** Footwear. Mishawaka Rubber & Woolen Mfg. Co., Mishawaka, Ind.

272,046. **Ann-X Shoe Shop.** Footwear. Kaufmann Department Stores, Inc., Pittsburgh, Pa.

272,061. **Fi.na.st.** Jar rings. First National Stores, Inc., Boston and Somerville, Mass.

272,078. **No-Slip.** Baby pants. The No-Slip Rubber Corp., New York, N. Y.

272,087. **Broadbrook.** Men's clothing, including raincoats. Ritter & Meyer, assignor to Strouss-Hirshberg Co., both of Youngstown, O.

272,100. Rectangle containing representation of an eagle and the words: **"Eagle Erasall."** Erasers. Eagle Pencil Co., New York, N. Y.

272,188. **En Route.** Apparel for women and children, including footwear and gloves. Best & Co., Inc., New York, N. Y.

272,194. Representation of a foot across which appear the words: **"Tanner Arch."** Footwear. Tanners Shoe Co., Boston, Mass.

272,240. **Bathtex.** Rugs or floor covering. Textile Import Corp., New York, N. Y.

272,322. Word: **"Rubbercraft"** between two wavy lines. Mats and cushions. Rubbercraft Products Co., Akron, O.

272,393. **The Dunbrook.** Women's clothing, including raincoats. Rich & Ciri, New York, N. Y.

272,428. **Ephrol.** Atomizers, nebulizers, and bulb operated sprayers. Miller Wholesale Drug Co., Cleveland, O.

272,508. Seal containing representation of a horse's head and the words: **"Black Beauty."** Golf balls. W. T. Grant Co., Lynn, Mass., and New York, N. Y.

272,524. **Buddy.** Golf balls. Kirby, Block & Fischer, Inc., New York, N. Y.

272,582. Shield containing fanciful design and the word: **"Defender."** Hot water bottles. United Drug Co., Boston, Mass.

272,622. **Municipal.** Fire hose. Hewitt-Gutta Percha Corp., Buffalo, N. Y.

272,640. **Toptex.** Raincoats. Triangle Raincoat Co., Inc., New York, N. Y.

272,711. **Water-Rings.** Life preservers, swimming belts, etc. Ayvad Mfg. Co., Hoboken, N. J.

272,717. **Ritz Balloon.** Tires and tubes. Vogue Rubber Co., Chicago, Ill.

272,726. Parallelogram containing the words: **"Guy's Smart Shoes."** Footwear. J. K. Orr Shoe Co., Atlanta, Ga.

272,769. Fanciful design and the words: **"A W. H. R. Product."** Sanitary rubber protectors and finger cots. W. H. Reed, doing business as W. H. Reed & Co., Atlanta, Ga.

272,825. **Sanigenic.** Syringes. J. W. Spencer, doing business as Hygienic Laboratories, New Orleans, La.

272,930. **Supertreader.** Vulcanizing molds and parts thereof. Super Mold Corp., Lodi, Calif.

272,970. **Gull.** Coats. Chicago Rubber Clothing Co., Racine, Wis.

272,980. **Aristo.** Golf balls. Sears, Roebuck & Co., Chicago, Ill.

272,989. **Dormie.** Golf balls, clubs, and caddy bags. Wilson-Western Sporting Goods Co., Chicago, Ill.

273,056. **Fashion Tailored.** Men's clothing, including raincoats. Sears, Roebuck & Co., Chicago, Ill.

Dominion of Canada

49,688. **One-Stop.** Automobile supplies, accessories, and parts thereof; tires and parts thereof and accessories thereto; clothing; radio and photographic apparatus; paints; toilet articles, etc. Firestone Tire & Rubber Co. of Canada, Ltd., Hamilton, Ont.

49,708. **Paralastic.** Squeezing rolls. American Wringer Co., Inc., Woonsocket, R. I., U. S. A.

49,762. **Maple Leaf.** Erasers, pens, pencils, etc. Eagle Pencil Co., New York, N. Y., U. S. A.

49,788. **Polar Grip.** Tires. Firestone Tire & Rubber Co. of Canada, Ltd., Hamilton, Ont.

United Kingdom

502,344 and 502,345. Word: **"Excelsior"** between two circles, each containing the letter: **"E."** All goods in Class 11, excluding orthopedic devices and artificial teeth and like goods, and all goods in Class 40, excluding elastic sandallings, gusset webs, and like goods. Continental Gummi-Werke A. G., Hannover, Germany.

504,868. **Contiflex.** Driving and conveyor belts. Continental Gummi-Werke A. G., Hannover, Germany.

510,576. **Ferrofix.** Cement. Alfred Jeffery & Co., Stratford, London, E. 15.

510,577. **Glovetto.** Galoshes. Helsingborgs Gummifabriks Aktiebolag, Helsingborg, Sweden.

510,578. **Gluvosh.** Galoshes. Helsingborgs Gummifabrik. Aktiebolag, Helsingborg, Sweden.

510,914. **Aquadorco.** Goods of rubber and gutta percha not included in other classes than Class 40. Dr. Dorogi És Társa Gummigyár Részvéntársaság, Budapest, Hungary.

B511,235. **Renshaw.** Bicycle tires and tubes. Halford Cycle Co., Ltd., Birmingham.

511,490. Triangle containing representation of a scythe and a hammer and Russian letters whose transliteration and translation are: **"V.S.N.Kh.; Gos Trest Rezin Promish** (National Trust for the Rubber Industry); **S.S.S.R. Moskva** (S.S.S.R. Moscow)." Goods of rubber and gutta percha not included in any other classes than Class 40. Gosudarstvenni Trust Resinovoi Promishlennosti "Resinotrust," Moscow, Russia.

511,646. **Velva.** Flooring tiles. Velva Silent Flooring Co., London, W. C. 2.

511,931. **Fron-Tennis.** Tennis sporting articles. Dunlop Rubber Co., Ltd., Fort Dunlop, Birmingham.

512,190. **Ben Hur.** All goods in Class 40. Dunlop Rubber Co., Ltd., Fort Dunlop, Birmingham.

512,387. **Henlex.** Rubber covered wire. W. T. Henley's Telegraph Works, Ltd., London, E. C. 1.

512,481. **Permcol.** Ebonite, vulcanite, india rubber, gutta percha, or compositions in which such materials predominate, sold in sheets, panels, tubes, rods, bars, strips, and molded pieces, and articles not included in other classes than Class 40, made from such materials or compositions. British Hard Rubber Co., Ltd., Middlesex.

B512,541. **Ped-Pad.** Contrivances (not medicated) for surgical or curative use. St. Albans Rubber Co., Ltd., London, E. C. 2.

512,652. **Amcosite.** Electrical insulating material. Siemens Bros. & Co., Ltd., London, S. W. 1.

512,802. **Viscorub.** Adhesives. Redfern's Rubber Works, Ltd., Hyde, near Manchester.

512,871. **Cutlass.** All goods in Class 40. Dunlop Rubber Co., Ltd., Fort Dunlop, Birmingham.

512,962. **Annealogic.** Electrical insulating materials. Telegraph Construction & Maintenance Co., Ltd., London E. C. 3.

Official Rubber Goods Production Statistics

Rubber Tires and Tubes	1930 Feb.	Mar.	Apr.	May	June	1929 May	June	Per Cent Increase (+) or Decrease (—) June, 1930 from May, 1930	June, 1930 from June, 1929	Cumulative Total from Jan. 1 Through June 30 1929	1930	Per Cent Increase (+) or Decrease (—) Cumulative 1930 from 1929
Pneumatic tires:												
Production ....thousands	3,645	3,891	4,518	4,574	4,098	6,109	5,478	—10.4	—25.2	33,365	24,315	—27.1
Stocks, end of month....thousands	9,929	10,010	10,461	10,745	10,622	13,386	13,468	— 1.1	—21.1	.....	.....	....
Shipments—												
Domestic ....thousands	3,150	3,587	3,886	3,960	4,050	5,185	5,288	+ 2.3	—23.4	28,990	21,981	—24.2
Export ....thousands	206	186	186	213	185	204	153	—13.1	+20.9	1,273	1,154	— 9.3
Inner tubes:												
Production ....thousands	3,707	3,953	4,408	4,428	3,960	5,745	5,234	—10.6	—24.3	32,270	24,141	—25.2
Stocks, end of month....thousands	10,429	10,543	11,028	11,082	10,889	14,196	14,056	— 1.7	—22.5	.....	.....	....
Shipments—												
Domestic ....thousands	3,344	3,682	3,769	3,940	4,082	5,146	5,115	+ 3.6	—20.2	29,456	22,595	—23.3
Export ....thousands	126	99	109	119	131	133	98	+10.1	+33.7	851	691	—18.8
Solid and cushion:												
Production ....thousands	22	19	17	17	17	40	40	0.0	—57.5	217	117	—46.1
Stocks, end of month....thousands	128	123	117	108	107	135	133	— 0.9	—19.5	.....	.....	....
Shipments—												
Domestic ....thousands	19	22	23	23	18	40	38	—21.7	—52.6	217	125	—42.4
Export ....thousands	2	2	2	1	2	3	3	+100.0	—33.3	15	11	—26.7
Other Rubber Products												
Rubber-proofed fabrics, production:												
Total ....thous. of yds.	3,441	3,570	4,029	3,775	.....	4,860	4,409	....	....	*18,668	*18,096	— 3.1
Auto fabrics....thous. of yds.	885	727	1,368	1,239	.....	919	1,199	....	....	*4,211	*5,185	+23.1
All other....thous. of yds.	1,081	1,211	1,071	1,205	.....	1,554	1,262	....	....	*6,344	*5,644	—11.0
Raincoat fabrics....thous. of yds.	1,475	1,632	1,590	1,333	.....	2,387	1,948	....	....	*8,113	*7,269	—10.4
Rubber heels:												
Production ....thous. of pairs	14,172	15,439	17,762	15,603	.....	19,541	20,007	....	....	*92,977	*78,446	—15.6
Shipments—												
To shoe manufacturers...thous. of pairs	8,837	8,458	9,201	7,431	.....	12,552	12,262	....	....	*55,441	*44,916	—19.0
To repair trade....thous. of pairs	6,511	7,189	4,641	5,221	.....	7,604	8,256	....	....	*35,581	*28,668	—19.4
For export....thous. of pairs	1,031	956	1,096	776	.....	1,054	926	....	....	*5,836	*4,908	—15.9
Stocks, end of month....thous. of pairs	38,250	36,546	37,618	38,595	.....	44,969	44,581	....	....	.....	.....	....
Rubber soles:												
Production ....thous. of pairs	2,338	2,582	2,593	1,939	.....	2,916	2,502	....	....	*15,008	*12,948	—13.7
Shipments—												
To shoe manufacturers...thous. of pairs	1,973	2,055	1,956	1,506	.....	2,361	2,185	....	....	*11,341	*10,751	— 5.2
To repair trade....thous. of pairs	392	407	380	332	.....	635	522	....	....	*3,579	*2,002	—44.1
For export....thous. of pairs	56	54	28	27	.....	32	17	....	....	*269	*303	+12.6
Stocks, end of month....thous. of pairs	3,171	3,349	3,272	3,019	.....	3,997	3,843	....	....	.....	.....	....
Mechanical rubber goods:												
Shipments—												
Total ....thous. of dolls	5,376	5,981	5,989	6,163	5,318	7,188	6,792	—13.7	—21.7	40,196	33,996	—15.4
Belting ....thous. of dolls	1,281	1,379	1,309	1,310	1,238	1,798	1,613	— 5.5	—23.2	9,343	7,667	—17.9
Hose ....thous. of dolls	2,190	2,500	2,593	2,703	2,199	2,643	2,658	—18.6	—17.3	15,413	14,219	— 7.7
All other....thous. of dolls	1,905	2,101	2,087	2,150	1,881	2,748	2,521	—12.5	—25.4	15,442	12,108	—21.6
Rubber bands, shipments....thous. of lbs.	230	248	197	211	177	205	187	—16.1	— 5.3	1,370	1,289	— 5.9
Rubber flooring, shipments..thous. of sq. ft.	530	533	570	615	.....	733	525	....	....	*2,782	*2,707	— 2.7
Calendered rubber clothing:												
Production ....no. coats and sundries	64,934	78,858	86,471	75,719	55,411	100,706	87,530	—26.8	—36.7	475,124	418,342	—12.0
Net orders....no. coats and sundries	39,568	97,612	89,862	110,520	21,249	78,972	98,444	—80.8	—78.4	374,596	390,449	+ 4.2

* Cumulative through May 30.

Source: *Survey of Current Business*, Bureau of Foreign and Domestic Commerce, Washington, D. C.

Tire Production Statistics

	High Pressure Pneumatic Casings: All Types Inventory	All Types Production	All Types Total Shipments	Cord Inventory	Cord Production	Cord Total Shipments
1928	10,217,708	58,457,873	55,721,937	3,580,576	19,302,218	19,351,380
1929	9,470,368	54,980,672	55,515,884	2,290,236	13,765,025	15,016,460
1930						
January	9,539,353	3,558,862	3,525,404	2,382,959	804,783	713,713
February	9,928,838	3,644,606	3,355,844	2,474,495	662,419	599,599
March	10,010,173	3,890,981	3,773,865	2,458,117	572,417	588,613
April	10,461,208	4,518,034	4,071,822	2,493,603	656,281	610,308
May	10,745,389	4,573,895	4,173,177	2,421,953	618,012	677,999
June	10,621,634	4,097,808	4,234,994	2,258,517	584,089	748,203

	Balloon Casings Inventory	Balloon Casings Production	Balloon Casings Total Shipments	Solid and Cushion Tires Inventory	Solid and Cushion Tires Production	Solid and Cushion Tires Total Shipments
1928	6,594,978	38,878,218	35,931,982	152,120	508,223	512,602
1929	7,160,127	41,128,577	40,377,781	122,200	409,344	427,779
1930						
January	7,139,154	2,779,864	2,805,740	126,784	25,049	21,476
February	7,436,247	2,975,922	2,750,324	127,793	22,302	21,005
March	7,535,468	3,311,978	3,177,634	123,179	19,329	23,951
April	7,951,317	3,854,540	3,454,171	116,595	17,335	24,232
May	8,323,436	3,955,883	3,495,178	108,055	16,752	24,426
June	8,363,087	3,513,719	3,486,791	106,589	16,612	19,613

	High Pressure Inner Tubes Inventory	High Pressure Inner Tubes Production	High Pressure Inner Tubes Total Shipments	Balloon Inner Tubes Inventory	Balloon Inner Tubes Production	Balloon Inner Tubes Total Shipments
1928	5,037,716	23,255,891	23,749,966	7,049,748	36,878,990	34,095,223
1929	3,339,451	16,100,281	17,718,806	6,889,213	38,921,749	38,719,177
1930						
January	3,233,813	783,709	889,208	6,911,422	2,898,682	2,992,752
February	3,243,130	675,126	680,989	7,171,395	3,030,745	2,786,578
March	3,137,472	619,416	696,161	7,392,794	3,331,739	3,082,456
April	3,144,558	678,152	674,032	7,871,181	3,728,177	3,202,261
May	2,983,388	683,236	769,463	8,098,115	3,745,131	3,289,384
June	2,781,524	641,508	914,909	8,107,920	3,318,464	3,297,573

	Cotton and Rubber Consumption Casings, Tubes, Solid and Cushion Tires: Cotton Fabric Pounds	Crude Rubber Pounds	Consumption of Motor Gasoline (100%) Gallons
1928	222,243,398	600,423,401	13,633,452,000
1929	208,824,653	583,039,984	14,748,552,000
1930			
January	14,559,163	42,108,149	1,080,660,000
February	13,766,977	40,378,929	1,060,640,000
March	14,655,987	43,910,926	1,241,240,000
April	17,263,963	51,151,863	1,382,400,000
May	17,436,928	52,130,471	1,459,880,000
June	15,034,336	45,705,967	1,508,220,000

Rubber Manufacturers Association figures representing 75 per cent of the industry.

MARKET REVIEWS

Crude Rubber

New York Exchange

THE situation in the rubber market has shown little change from last month and probably will continue on its dull course for the next few months. Prices gradually worked lower, with 9.40 cents in the "A" contract the extreme record.

Although prices are the lowest in rubber history, traders do not look for any improvement and would not be surprised at slightly lower levels. Present prices are far below the cost of production, but world conditions have combined to create strictly a buyer's market.

World consumption of crude rubber at present is approximately 115,000 tons below production. Stocks are steadily being accumulated at all centers, with an increase of over a thousand tons estimated for the week of August 23 at London and Liverpool. Enough rubber is on hand at present to meet demands for the next six months.

While association after association in the Far East brings in resolutions asking for governmental aid in reference to restriction, native production in producing areas continues to increase rapidly. The larger estates in Malaya showed a gain in production of almost 2,500 tons in July over June, with stocks increasing more than 3,000 tons.

The outlook in the tire industry continues to be unattractive as predicted. Original equipment and replacement demand are declining materially from similar periods in the year before, and the industry is faced with the possibility of a price war. If present prices could have been maintained, tire manufacturers would have been able to realize substantial profits in the next few months, by taking advantage of the greatly reduced prices for crude material. News has already been received of competitive price cutting efforts, and a large mail order house has canceled an increase in prices which was to have gone into effect in the Fall.

Automobile production for the seven months ended July 31 declined over 35 per cent, compared with the like period in 1929. For the month of July the decline was over 49 per cent. This latter reduction, of course, was due to the fact that many of the manufactories had been closed for inventories and vacations. The figure will undoubtedly improve for August, with the resumption of activities and introduction of new models, but even here these favorable indications are offset by competitive efforts.

The rubber market faces a trying time when patience will be one of the best of assets. The prospects for the next few months promise to be no better than they have been for quite some time past. Instead of anticipating better conditions after the close of the summer, the general feeling now is that matters will not right themselves until after the close of the year.

RUBBER BULL POINTS

1. **Preliminary tire figures indicate that inventories will show a material reduction from July 31.**
2. **Conviction is growing in the Far East that the government will take action in reference to restriction efforts.**
3. **Crude rubber quotations are below the cost of production.**
4. **Manufacturers are curtailing output to meet demand.**
5. **Possibility exists that, with improved business sentiment, manufacturers will purchase supplies for a long time ahead.**

RUBBER BEAR POINTS

1. **World production is now running at an annual rate of 840,000 tons, while consumption will have difficulty in taking care of 725,000 tons during 1930.**
2. **July production of crude rubber on estates of over 100 acres in Malaya totaled 22,704 tons dry weight against 20,293 tons in June.**
3. **Stocks of crude rubber of all grades on above estates totaled 25,814 tons at July 31, compared with 22,988 tons on June 30.**
4. **Rubber continues to be accumulated in large amounts at world centers. Present supplies would meet requirements for six months.**
5. **Consumption in both original equipment and replacement tire fields was much smaller in first six months of 1930 than in like 1929 period.**

With agitation in the Far East growing stronger for restriction and with local opinion leaning toward the attitude that the government will take no action, an interesting topic for discussion has grown up.

Week ended August 2: In a communiqué received in London from the British Rubber Growers' Association, government legislation for the regulation of rubber in all producing countries was suggested. There were six recommendations made by the British-Dutch liaison committee, and in brief form they are as follows:

First, a voluntary scheme would be ineffective; second, without regulation of output, the foundation of the industry is threatened, and the livelihood of all concerned, native and European; third, widespread distress is only avertible by the intervention of the governments, and it is desirable to ascertain as speedily as possible whether they are prepared to introduce legislation; fourth, native production should be included at a price which will keep the industry solvent—9 pence a pound in Europe (about 18 cents); fifth, details of the regulations must be agreed on in consultation with representatives of the industry; sixth, the governments should discourage extensions to the area planted with rubber until the situation is clarified.

A Singapore cable dispatch stated that Chinese rubber estate owners and merchants at Jahore have approved the resolution adopted by the Asiatic Planters Association of July 20.

Prices declined gradually during the week, reaching new all-time lows. Factories operated at reduced capacity, and submitted almost no inquiry. Prices at the close of August 2, on "No. 1 Standard" contract were:

Positions	High	Low	Close	Yesterday's Close
Aug.	....	....	10.27	10.45
Sept.	10.55	10.51	10.51/55	10.55
Oct.	....	....	10.65	10.69
Nov.	....	....	10.78	10.83
Dec.	....	....	10.92	10.96
Jan.	....	....	11.05	11.10
Feb.	....	....	11.17	11.23
Mar.	11.25	11.25	11.30/33	11.36
Apr.	....	....	11.47	11.53
May	11.64	11.64	11.64	11.70
June	....	....	11.80	11.85
July	....	....	11.96	12.00
Spot	....	....	10.25	10.38

The Rubber Exchange of New York, Inc.

DAILY MARKET FUTURES—RIBBED SMOKED SHEETS—CLEARING HOUSE PRICES—CENTS PER POUND—"NO. 1 STANDARD" CONTRACTS

Positions	July, 1930				August, 1930																				
1930	28	29	30	31	1	2	4	5	6	7	8	9	11	12	13	14	15	16	18	19	20	21	22	23
July	10.64	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Aug.	10.74	10.60	10.65	10.48	10.45	10.27	10.40	10.28	10.20	10.25	10.20	10.23	9.90	9.65	9.75	9.93	9.85	9.75	9.60	9.45	9.77	9.85	9.65	9.72
Sept.	10.84	10.70	10.75	10.58	10.55	10.51	10.50	10.38	10.30	10.35	10.30	10.33	10.10	9.82	9.85	10.03	9.95	9.87	9.60	9.55	9.77	9.95	9.65	9.72
Oct.	10.96	10.81	10.88	10.71	10.69	10.65	10.64	10.51	10.44	10.47	10.41	10.46	10.22	9.93	9.99	10.16	10.09	10.00	9.74	9.68	9.91	10.11	9.81	9.92
Nov.	11.08	10.91	11.00	10.83	10.83	10.78	10.77	10.63	10.58	10.59	10.51	10.58	10.33	10.04	10.13	10.29	10.22	10.13	9.88	9.82	10.06	10.27	9.97	10.11
Dec.	11.20	11.02	11.12	10.95	10.96	10.92	10.90	10.75	10.72	10.70	10.62	10.70	10.45	10.15	10.27	10.42	10.35	10.26	10.02	9.96	10.22	10.45	10.12	10.30
1931																								
Jan.	11.35	11.18	11.27	11.10	11.10	11.05	11.04	10.91	10.85	10.84	10.80	10.84	10.60	10.32	10.41	10.57	10.49	10.40	10.16	10.09	10.36	10.57	10.25	10.44
Feb.	11.50	11.34	11.41	11.24	11.23	11.17	11.18	11.06	10.98	10.97	10.96	10.98	10.75	10.49	10.54	10.71	10.62	10.53	10.29	10.22	10.49	10.68	10.37	10.57
Mar.	11.65	11.50	11.55	11.38	11.36	11.30	11.32	11.20	11.10	11.10	11.10	11.12	10.90	10.66	10.68	10.85	10.75	10.67	10.40	10.36	10.62	10.79	10.50	10.71
Apr.	11.83	11.70	11.73	11.54	11.53	11.47	11.48	11.34	11.26	11.27	11.24	11.27	11.01	10.78	10.78	10.95	10.85	10.77	10.53	10.46	10.71	10.89	10.60	10.83
May	12.04	11.90	11.90	11.70	11.70	11.64	11.63	11.46	11.42	11.44	11.38	11.42	11.12	10.90	10.88	11.05	10.95	10.87	10.65	10.57	10.81	10.98	10.71	10.95
June	12.19	12.06	12.06	11.86	11.85	11.80	11.83	11.62	11.60	11.58	11.52	11.57	11.26	11.05	11.03	11.25	11.10	11.02	10.82	10.77	10.99	11.16	10.90	11.10
July	.....	.....	.....	.....	.....	12.00	11.96	12.10	11.80	11.80	11.73	11.66	11.72	11.40	11.25	11.18	11.45	11.30	11.20	11.00	10.97	11.17	11.32	11.10	11.25

Week ended August 9: Crude rubber stocks in London were expected to show a decrease of about 450 tons and of about 250 tons in Liverpool. Malay shipments of crude rubber to the United States during July totaled 24,470 tons, compared with 26,491 tons shipped during June, a decrease of 2,021 tons. Crude shipments from Malaya to the United Kingdom showed an increase, totaling 9,218 tons for July, against 4,673 tons in June. Shipments to all countries for the month amounted to 41,347 tons, compared with 36,657 tons in June.

Ford, in company with a number of other factories, resumed operations in Detroit. It is expected that original equipment demand for the next sixty days will show a slight increase, but tire manufacturers are expecting no sustained improvement.

The Rubber Exchange reported that utilization of crude rubber in liquid form, known in the rubber trade as "liquid latex," underwent considerable expansion during the first half of the year by American tire manufacturers. Importations for the six months ended with June 30, 1930, amounted to 5,286,276 pounds, as compared with 2,925,173 pounds during the corresponding period of last year. The average value of latex imported this year also was lower, amounting to 17.5 cents per pound, as against 21.5 cents per pound during the previous year. The total importations were valued at $926,390, as against $631,250 in 1929.

In reference to the automobile situation the following quotation in the *Herald Tribune* is pertinent: "The low production level last month is significant of the determined effort on the part of the industry to liquidate the retail situation thoroughly. . . . This condition not only is clearing dealers' shelves of new cars to a point where shortages are likely to develop with any stimulation in public buying, but also enables the dealer body to concentrate on liquidation of used car stocks. . . . With lower production during the present month the industry will go into the more active fall market with an inventory situation in the retail field which is without precedent for many years past."

RUBBER EXCHANGE ACTIVITIES

Transactions

Week Ended	Contracts Sold: Number	Contracts Sold: Tons	Transferable Notices	Week-End Tone
Aug. 2	1,283	3,207.5	130	Quiet and steady
Aug. 9	1,002	2,505.0	0	Quiet and steady
Aug. 16	1,324	3,310.0	5	Quiet and steady
Aug. 23	1,691	4,227.5	53	Steady
Totals	5,300	13,250.0	188	

No further news was received in reference to the British and Dutch growers' restriction efforts, but it is generally felt that the various governments will take no action. Prices at the close of August 9 on "No. 1 Standard" contract follow:

Positions	High	Low	Close	Yesterday's Close
Aug.	....	....	10.23	10.20
Sept.	10.27	10.27	10.33	10.30/40
Oct.	....	....	10.46	10.41
Nov.	....	....	10.58	10.51
Dec.	10.60	10.60	10.70	10.62/65
Jan.	....	....	10.84	10.80
Feb.	....	....	10.98	10.96
Mar.	11.06	11.06	11.12/15	11.10/12
Apr.	....	....	11.27	11.24
May	11.42	11.35	11.42	11.38/40
June	....	....	11.57	11.52
July	....	....	11.72	11.66
Spot	....	....	10.25	10.12

Week ended August 16: The remarks of Col. Sir Robert Williams, chairman of the Anglo-Dutch Plantations of Java, made at the last general meeting of the company in London, are pertinent at this time and serve to show why our traders are so pessimistic whenever governmental aid is asked for enforcing restriction agreements. Colonel Williams believes that any scheme of rubber restriction which does not include the native or Asiatic producer is doomed to failure.

"If such a scheme did result in advancing prices, the native producer, with the greater benefit he would be obtaining on his unrestricted output, would be encouraged to go on planting until the control of the industry virtually passed into his hands."

Neither the rubber manufacturers nor the government would welcome this development, the chairman continued. "I cannot imagine a greater calamity befalling them. The motor industry, after all, is entirely dependent upon an ample and steady supply of raw rubber for its existence."

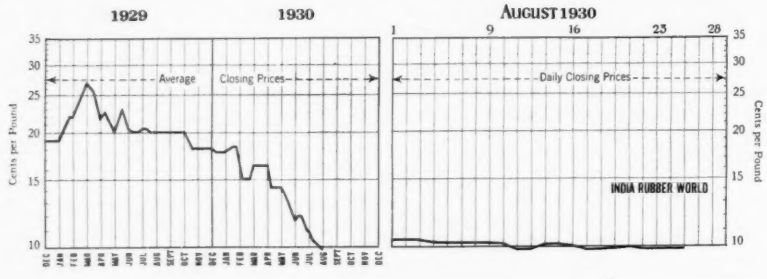
Meanwhile native growers are continuing their restriction efforts. Asiatic rubber producers, meeting at Perak, passed a resolution asking the government to reintroduce the Stevenson Scheme of rubber restriction in a modified form, provided the Dutch join in a similar curtailment move; and the sub-committee of the Straits Settlements Association, which has been investigating the unfavorable rubber situation created by current overproduction, has submitted the following report, according to cables to the Rubber Exchange:

"The sub-committee interviewed the colonial secretary, who intimated that the representations made by the association and kindred bodies representing the industry would be taken as a whole and considered as good evidence that a majority in the industry favored government assistance. The sub-committee recommends that the Straits Settlements Association ask the government to appoint a committee of inquiry."

The course of prices on the Rubber Exchange during the week was highly irregular. After setting new all-time lows, the market registered slight gains, induced by short covering, but continued selling pressure weakened the market and it turned reactionary on Friday. With quiet trading and few sales, crude rubber futures on Saturday closed quiet and steady. London and the Far East closed higher than New York on Friday, but the gap was soon closed.

The Rubber Manufacturers' Association issued figures showing that rubber consumption for the first seven months of 1930 was better than any year except 1929. The figure, 249,775 long tons, although 19.6 per cent less than 1929, was .3 per cent more than the same period in 1928, 7.9 per cent more than 1927, 16.4 per cent more than 1926, 6.6 per cent more than 1925, 37.0 per cent more than 1924, and 22.3 per cent more than 1923. Prices at the close

New York Outside Market—Spot Closing Prices Ribbed Smoked Sheets



New York Outside Market—Spot Closing Rubber Prices—Cents Per Pound

	July, 1930: 28	29	30	31	August, 1930: 1	2	4	5	6	7	8	9	11	12	13	14	15	16	18	19	20	21	22	23
Ribbed Smoked Sheet	10¼	10½	10½	10⅜	10⅜	10⅜	10⅜	10¼	10¼	10¼	10¼	10¼	10⅛	9⅞	9⅞	10⅛	10⅛	10	9¾	9¾	9⅞	10	9⅞	9⅞
No. 1 Thin Latex Crepe	11¼	11	11	10⅞	10⅞	10⅞	10⅞	10¾	10¾	10¾	10¾	10¾	10½	10¼	10¼	10½	10½	10½	10¼	10¼	10⅜	10½	10⅜	10⅜
No. 1 Thick Latex Crepe	10¾	10½	10½	10⅜	10⅜	10⅜	10⅜	10¼	10¼	10¼	10¼	10¼	10⅛	9⅞	9⅞	10⅛	10⅛	10	9¾	9¾	9⅞	10	9⅞	9⅞
No. 1 Brown Crepe	10⅛	9⅞	9⅞	9⅝	9⅝	9¾	9¾	9⅝	9⅝	9⅝	9⅝	9⅝	9½	9¼	9¼	9½	9½	9⅜	9⅛	9⅛	9¼	9⅜	9¼	9⅜
No. 2 Brown Crepe	9⅞	9⅝	9⅝	9⅜	9⅜	9½	9½	9⅜	9⅜	9⅜	9⅜	9⅜	9⅛	8⅞	8⅞	9⅛	9⅛	9	8⅞	8⅞	9	9⅛	9	9⅛
No. 2 Amber	10	9¾	9¾	9⅝	9⅝	9⅝	9⅝	9½	9½	9½	9½	9½	9⅜	9⅛	9⅜	9⅜	9¼	9⅛	9⅛	9⅛	9¼	9⅜	9¼	9⅜
No. 3 Amber	9¾	9½	9½	9⅜	9⅜	9⅜	9⅜	9¼	9¼	9¼	9¼	9¼	9	8¾	8¾	9	9	9	8⅞	8⅞	9	9⅛	9	9⅛
No. 4 Amber	9½	9¼	9¼	9	9	9	9	8⅞	8⅞	8⅞	8⅞	8⅝	8⅝	8⅜	8⅜	8⅝	8⅝	8⅝	8½	8½	8⅝	8¾	8⅝	8⅝
Rolled Brown	8⅜	8⅜	8⅜	8⅜	8⅜	8⅜	8⅜	8	8	8¼	8¼	8¼	8⅛	7¾	7⅞	8⅛	8⅛	8	7⅞	7⅞	8	8⅛	8	8

of August 16, on "No. 1 Standard" contract were:

Positions	High	Low	Close	Yesterday's Close
Aug.	....	....	9.75	9.85
Sept.	9.77	9.77	9.87	9.95/80
Oct.	....	....	10.00	10.09
Nov.	....	....	10.13	10.22
Dec.	....	....	10.26	10.35/40
Jan.	....	....	10.40	10.49
Feb.	....	....	10.53	10.62
Mar.	10.61	10.57	10.67	10.75/78
Apr.	....	....	10.77	10.85
May	....	....	10.87	10.95/11.00
June	....	....	11.02	11.10
July	....	....	11.20	11.30
Spot	....	....	9.87	9.93

Week ended August 23: Rumors of the rate of rubber exports from Malaya, chief producing country, seem to have been confirmed by estimates cabled to the members of the New York Rubber Exchange. Shipments for the first half month were 25,000 tons, and it is expected that the month will show shipments of approximately 44,000 tons. Last month the figure was 41,347 tons, and for June it totaled 36,657 tons.

The movement for restriction seems to be growing stronger in the producing area, and at a meeting of Malayan rubber producers held at Kuala Lumpur on Thursday, they adopted the resolution passed by the Asiatic Planters' Association of Malaya on July 20, recommending curtailment of production, and appointed a committee to confer with the governor of the Straits Settlements

The planters also recommended that the government, in connection with the Dutch East Indies government and Ceylon should not alienate land for rubber growing for a period of years.

In spite of the fact that many of the native associations have adopted resolutions asking their governments to enforce their restriction agreements, local traders are still of the opinion that nothing will come of it. The government might try to persuade native producers that it is to their best interests to restrict their output, but it is hardly likely that the government will take part in a plan whose success and effectiveness is doubtful at best. Action of crude rubber prices, whenever this matter comes up, seems to justify the attitude of traders. So far the market has paid no attention to the various reports.

Prices for the week were highly irregular, with a low of 9.40 in the "A" contract and a high of 9.80. At the end of the week the market was somewhat weaker in the face of poor cables and September liquidation. In its letter of August 21, H. Hentz & Co. close with this prediction:

"Until better business is encountered, prices will probably fluctuate around these levels or perhaps work slightly lower, but for the investor with patience we feel purchases made now will eventually show a profit."

At present levels the cost of producing crude rubber is greater than the price the commodity commands at the market, and those tire companies with their own plantations are probably being pinched. But those companies which have adjusted their inventories stand to profit by the unprecedented low prices of their raw material if present prices of tires can be maintained.

Prices at the close of August 23, on "No. 1 Standard" contract were:

Positions	High	Low	Close	Yesterday's Close
Aug.	....	....	9.72	9.65
Sept.	....	....	9.72/75	9.65/69
Oct.	....	....	9.92	9.81
Nov.	....	....	10.11	9.97
Dec.	10.30	10.30	10.30	10.12
Jan.	....	....	10.44	10.25
Feb.	....	....	10.57	10.37
Mar.	10.75	10.60	10.71/75	10.50/52
Apr.	....	....	10.83	10.60
May	10.95	10.83	10.95	10.71/72
June	....	....	11.10	10.90
July	11.30	11.30	11.25	11.10
Spot	....	....	9.95	9.75

On August 25 the market tone was steady and quiet. Contracts sold were 29 "No. 1 Standard" and 172 "A." Spot ribs closed at 9.83 cents nominal and on the 26th advanced to 10 cents.

New York Outside Market

With factories pretty well stocked with crude rubber, market activity has been rather slow during the month. What little buying that has been done was in evidence on the dips to the record low levels to which the prices of rubber fell. One of the causes for this drop is the large amount of rubber on hand, so that buying of actuals was of necessity in very small quantities.

Rumors from Akron indicate that at least one of the large manufacturers is going to close for a week in September

New York Quotations

Following are the New York outside market rubber quotations for one year ago, one month ago, and August 26, the current date

Plantation Hevea	August 27, 1929	July 26, 1930	August 26, 1930
Rubber latex (Hevea)	$1.50 @	$1.00 @	$1.00 @
Sheet			
Rubbed, smoked, spot	.20⅝@	.10¾@.10⅞	.09¾@.09⅞
August-September	.20⅝@	.10⅞@.11	.09¾@.09⅞
October-December	.21⅜@	.11¼@.11⅜	.10 @.10⅛
January-March	.22 @	.11¼@.11⅞	.10¼@.10½
January-June	.22½@	@	.10½@.11
CREPE			
No. 1 Thin latex (first latex) spot	.21⅝@	.11¼@.11½	.10¼@
August-September	.21⅝@	.11⅜@.11½	.10¼@
October-December	.22¼@	.11¾@.11⅞	.10½@
January-March	.23 @	.12¼@.12⅜	.10¾@
January-June	.23½@	@	.11 @
No. 2 Amber, spot ("B" blanket)	.18 @	.10¼@	.09⅛@
August-September	.18 @	.10¼@.10⅜	.09⅛@
October-December	.18¼@	.10½@.10¾	.09⅜@
January-March	.18¾@	.11 @.11¼	.09⅝@
January-June	.19⅜@	@	.09⅞@
No. 3 Amber, spot ("C" blanket)	.17¾@	.09¾@.10	.08⅞@
No. 1 Brown, clean, light, thin	.17½@	.10¼@	.09⅛@
No. 2 Brown, clean, thin	.17 @	.09⅞@.10	.08⅞@
Brown, roll	.12½@	.08⅜@.08½	.07⅞@
East Indian			
PONTIANAK			
Banjermasin	.10 @	.07 @	.07 @
Pressed block	.16 @.17	.12½@.13	.12 @.12½
Sarawak	.10 @	.07 @	.07 @
South American			
PARAS			
Upriver, fine	.21 @	.13 @	.12¼@
Upriver, fine	*.27 @	*.17¾@	*.16¾@
Upriver, coarse	.11¼@	.06 @	.06 @
Upriver, coarse	*.18½@	*.12 @	*.10½@

South American	August 27, 1929	July 26, 1930	August 26, 1930
PARAS—*Continued*			
Islands, fine	$0.19¼@	$0.14 @	$0.13 @
Islands, fine	.26¾@	*.17½@	*.16½@
Acre, Bolivian, fine	.21½@	.13½@	.12½@
Acre, Bolivian, fine	.27¼@	*.18 @	*.17 @
Beni, Bolivian	.21¾@	.13¼@	.12½@
Madeira, fine	.21¼@	.13 @	.12¼@
CAUCHO			
Upper caucho ball	.11¼@	.06 @	.06 @
Upper caucho ball	.18½@	*.12 @	*.10½@
Lower caucho ball	.10¾@	.05½@	.05½@
Maniçobas			
Ceará negro heads	@	†.14 @	@
Ceará scrap	@	†.08 @	@
Manicoba, 30% guaranteed	@	†.16 @	†.10 @
Mangabiera, thin sheet	@	†.16 @	†.14 @
Guayule			
Duro, washed and dried	.19 @	.16 @	.15 @
Ampar	.20 @	.17 @	.16 @
Gutta Percha			
Gutta Siak	.21¼@	.13½@	.12¾@.13¼
Gutta Soh	.29 @.30	.25 @	.25 @.26
Red Macassar	2.50 @2.60	2.00 @2.10	2.20 @2.95
Balata			
Block, Ciudad Bolivar	.52 @	.41 @	.36 @
Colombia	.47 @	†.36½@	.36 @.37
Manaos block	.59 @	.44 @	.40 @.41
Surinam sheet	.56 @	.60 @	.58 @.59
Amber	.57 @	.62 @	.61 @

* Washed and dried crepe. Shipment from Brazil.
† Nominal.

and will reopen on a reduced schedule and rate of production. Whatever advantage the manufacturers might have had from the low prices and their adjusted inventories will probably be wiped out by competition.

The key to the situation now appears to lie in the hands of the public. Economically, the industry has had a good shaking down, and as soon as public confidence is restored, as soon as general business conditions improve, rubber will find its proper place. When that change in sentiment will occur, however, we would not venture to guess.

Week ended August 2: In the face of the bank holiday in London the market closed the week very dull. The establishment of new all-time low prices in London early in the week was followed by a correspondingly lower market in rubber futures locally. On Friday, August had dropped to 10.30, and October 10.60, closing the week at 10.50.

Announcement was made during the week that the British Rubber Growers, in cooperation with the Dutch, would urge that the government pass legislation forcing all countries to cut output. The object was to maintain a price which would keep the industry solvent and to regulate the native growers.

The majority of the traders were still of the opinion that the government would not take favorable action. They pointed out that while 112 companies were in favor of governmental action, they represented only 60 per cent of production represented, while the 21 large companies opposed, represented 40 per cent of the tonnage involved. Thus, the large owners are opposed to it, the American growers are opposed, and the native growers are undoubtedly against governmental restriction. Also, the government would require a majority of at least 80 to 85 per cent, and since only 60 per cent voted affirmatively, observers feel that no action will be taken by the governments involved. Closing prices on August 2 were:

Spot	August 2	Month Ago	Year Ago
Crepe	10⅞	12⅝	22⅜
Ribs	10⅜	12¼	21¼
Upriver fine ...	13	14¼	22½

Week ended August 9: In spite of the resumption of operations by many manufacturers, factory inquiry was not in evidence to any great extent. The adjusted index compiled by the *New York Times*, stood at 73.0 for the week ended August 9, in comparison with 39.4 for the preceding week and 127.1 for the corresponding week last year. Eliminating the factories, however, which resumed operations after being closed, the tendency was distinctly downward.

Tire output has suffered as a result of an almost complete lack of original equipment buying, necessitating the holding of inventories at minimum levels. While replacement buying has shown some recent improvement and a continuation of a more active market is expected for the next sixty days, the actual sales volume has not reached expectations.

Prices were irregular, with September reaching a new low level at 10.20 cents. In London the August position touched a new low of 5 pence. Malay exports for

RUBBER AFLOAT TO THE UNITED STATES

All figures in long tons

Week Ended	British Malaya	Ceylon	Netherland East Indies	London and Liverpool	Total
Aug. 2....	6,531	914	996	7	8,448
Aug. 9....	5,397	914	1,939	..	8,250
Aug. 16....	6,177	820	1,810	25	8,832
Aug. 23....	7,498	488	1,503	..	9,489

July were 41,347 tons, against 36,657 tons in June and 46,454 tons in July last year. Imports were 12,759 tons against 12,120 in June and 15,071 in July, 1929.

The general opinion in the trade in reference to the recent efforts at restriction, is that nothing will materialize in the immediate future. Both the British and the Dutch governments, it is felt, will be loathe to enact legislation that will be coercive of the native growers. Closing prices on August 9 were:

Spot	August 9	Month Ago	Year Ago
Crepe	10¾	12⅛	21¾
Ribs	10¼	11⅝	20⅞
Upriver fine....	13¼	14	22½

Week ended August 16: Advices from Akron indicate that consumption of rubber by manufacturers in August is not expected to be any greater than was the consumption for the month of July. There was fairly good inquiry from factories during the week, with buying orders coming in on the declines.

After reaching new record low levels at about 9½ cents the market recovered some of its ground when shorts began to cover, but prices were irregular at the close of the week. On Friday London closed higher than New York, but this condition was corrected on Saturday. The uncertain course of the market has been largely the result of manipulations by professional operators, with support coming from satisfied shorts.

Consumption in July is estimated at 29,894 long tons, against 34,463 long tons in June and 42,526 long tons in July, 1929. Closing prices on August 16 were:

Spot	August 16	Month Ago	Year Ago
Crepe	10¼	11½	21⅜
Ribs	10	11	20⅜
Upriver fine....	13¼	13½	21¾

Week ended August 23: Prices continued their bearish trend, with professional traders manipulating it almost at will. The market opened the week tired, and operators had no trouble in forcing to new low levels, culminating Tuesday when closing quotations read 9.40 to 9.50 cents.

With evidence of greater support the market steadied. Later, however, September liquidation in anticipation of heavy deliveries next week, poor cables, and prospects for an increase of over 1,000 tons in the British stocks next week all combined to send crude rubber values to lower levels.

If tire prices can be maintained for the next few months, tire manufacturers stand to make quite a substantial profit because of the record low levels of crude rubber. Reports, however, of price-cutting activities and the action of a mail order house in rescinding a proposed advance of 2 per cent in the price of tires, does not bode well for manufacturers. Closing prices on August 23 follow:

Spot	August 23	Month Ago	Year Ago
Crepe	10¾	11¾	21¼
Ribs	9⅞	10⅞	20
Upriver fine....	13¼	13¼	21½

Contrary reports are still being circulated in reference to the efforts at restriction. Traders here have been of the opinion that nothing would come of the effort. It now appears that growers in the Far East are insisting more and more strenuously that the government will have to take action. But even here the issue seems obscured because dispatches from London indicated that nearly a score of Dutch Indian rubber producing companies had announced their opposition to the plan for restricting the output of rubber.

The companies contended that the plan would merely aid the small native producers and ultimately would stimulate the native output. It is hard to make any kind of prediction while reports remain so conflicting in tone, but one salient fact remains—the price of rubber does not at present cover the cost of production.

Quiet conditions and general lack of interest prevailed in the market for actuals on August 25 and 26. September ribs closed at 9⅞ cents on the 25th and were essentially unchanged from this level on the 26th.

Consumption and Stocks

Despite the subnormal conditions in general business, consumption of crude rubber for the first seven months of 1930 was the highest on record with the exception of 1929. The figure 249,775 long tons although 19.6 per cent below 1929 was .3 per cent above the same period in 1928, 7.9 per cent above 1927, 16.4 per cent above 1926, 6.6 per cent over 1925, 37.0 per cent over 1924, and 22.3 per cent over 1923.

The usual summer adjustment of production schedules is reflected in the consumption of crude rubber of all classes by manufacturers in the United States for July, which is estimated at 29,894 long tons by The Rubber Manufacturers Association in its monthly statistical compilation. This compares with estimated consumption of 34,463 long tons in June, 41,526 long tons in July, 1929, and 37,407 long tons in July, 1928. While consumption for July was 28 per cent below July a year ago and 20 per cent below July, 1928, it was only 1.4 per cent below the average July consumption for the past eight years.

Imports of crude rubber of all classes into the United States during July totaled 34,084 long tons, according to estimates issued by the R. M. A. This compares with imports of 42,653 long tons in June, 44,252 long tons in July, 1929, and 33,382 long tons in July, 1928.

The association estimates total domestic stocks of crude rubber on hand and in transit overland on July 31 at 152,001 long tons compared with 151,551 long tons as of June 30, 95,536 long tons as of July 31, 1929. Crude rubber afloat for United States ports on July 31 is estimated at 58,326 long tons as against 58,658 long tons on June 30 and 46,145 long tons a year ago.

Rubber Scrap

THE demand for rubber scrap was very conservative in August and essentially the same as in the month previous. Prices on the principal items of tires and tubes were marked down without stimulating demand. Reclaimers are operating at a moderate pace largely utilizing their scrap reserves until the rubber industry regains its stride.

BOOTS AND SHOES. Demand is fair for these grades. Collections are running meager because present prices offer no inducement for profit. Prices on boot and shoe grades are quoted unchanged from a month ago.

INNER TUBES. The demand for inner tubes has improved. No. 1 and red tubes are unchanged in price; No. 2 and mixed tubes have declined slightly. The supply of inner tubes is somewhat restricted because of their better protection in service by the improved quality of casings now in use.

TIRES. The consuming demand for tire scrap grades is reported fairly good probably owing to low prices. All grades except solids are quoted at lower levels than a month ago. Mixed tires with beads are $13, down 50 cents; mixed beadless tires are $16, down $3; auto tire carcasses are now $22, down $2; black auto peelings are quoted $20, down $2. All of these quotations refer to the ton basis.

TRUCK TIRES. The price is quoted unchanged because the demand is able to absorb the available supply. As a market grade, solids are becoming decreasingly important.

SOLID TIRES. Demand is fair at prices steady and unchanged.

MECHANICALS. These grades were cut in price a month ago but are unchanged in the current market quotations.

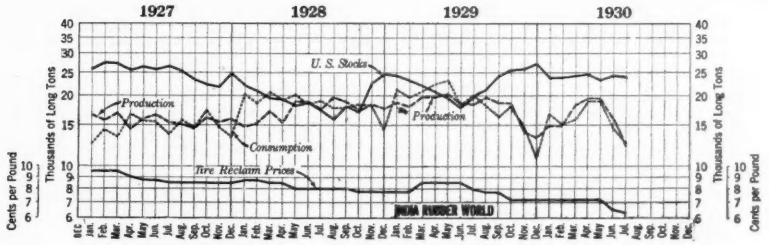
HARD RUBBER. No. 1 grade is firm and unchanged at 10 to 10½ cents.

CONSUMERS' BUYING PRICES

Carload Lots

Delivered Eastern Mills
August 26, 1930

	Prices
Boots and Shoes	
Boots and shoes, black..100 *lb.*	$1.10 @$1.15
Untrimmed arctics....100 *lb.*	.70 @ .80
Tennis shoes and soles..100 *lb.*	.60 @ .70
Inner Tubes	
No. 1, floating.....*lb.*	.06⅝ @ .06¾
No. 2, compound.....*lb.*	.02½ @ .02⅝
Red .....*lb.*	.02½ @ .02¾
Mixed tubes .....*lb.*	.02½ @ .02¾
Tires	
Pneumatic Standard	
Mixed auto tires with beads .....*ton*	13.00 @13.50
Beadless .....*ton*	16.00 @17.00
Auto tire carcass.....*ton*	22.00 @23.00
Black auto peelings....*ton*	20.00 @21.00
Solid	
Clean mixed truck....*ton*	24.50 @25.50
Light gravity .....*ton*	27.00 @29.00
Mechanicals	
Mixed black scrap.....*lb.*	.00¾ @ .01
Hose, air brake.....*ton*	14.00 @16.00
Garden, rubber covered..*lb.*	.00¾ @ .00½
Steam and water, soft..*lb.*	.00⅜ @ .00½
No. 1 red.....*lb.*	.02 @ .02¼
No. 2 red.....*lb.*	.01 @ .01½
White druggists' sundries..*lb.*	.02 @ .02½
Mechanical .....*lb.*	.01½ @ .01⅝
Hard Rubber	
No. 1 hard rubber.....*lb.*	.10 @ .10½



Production, Consumption, Stocks, and Prices of Tire Reclaim

Reclaimed Rubber

THE quotations reported below on standard type reclaims are unchanged from those given a month ago. As cited at that time, these prices are the lowest in the history of the rubber reclaiming industry and most advantageous to manufacturers of rubber goods.

Evidence that reclaimed rubber is not regarded nor used primarily as a substitute for crude rubber is seen in the following fact. In the long continued decline of crude rubber to a point below cost of production, the price of reclaim has declined relatively less than crude. Also the decline of its ratio of consumption to that of crude has dropped to 40.7 per cent from the average of 45.5 per cent for 1929. Were reclaim merely a substitute for crude, its use would virtually cease at current price levels for rubber. As a matter of fact indication of an improvement in demand is forecast by the fact that business in carload orders is again materializing.

July production remained curtailed to correspond with the consuming demand which seems to be the universal rule in all branches of manufacturing industry this year. Stocks of reclaim are maintained as nearly as may be at a point sufficiently high for prompt shipment on an easy going schedule.

Consumption of reclaimed rubber in the United States is estimated at 12,688 long tons for July, according to statistics compiled by the Rubber Manufacturers' Association. This compares with 14,410 long tons in June, 1930. The July consumption ratio of reclaim to crude was 42.2 per cent.

Prices on every grade of reclaim listed are quoted unchanged from one month ago.

New York Quotations

August 26, 1930

High Tensile	Spec. Grav.	Price Per Pound
Super-reclaim, black...	1.20	$0.09¼ @$0.09½
red	1.20	.09 @ .09¼
Auto Tire		
Black	1.21	.06¼ @ .06½
Black selected tires....	1.18	.06½ @ .06¾
Dark gray	1.35	.07¾ @ .08
White	1.40	.09¾ @ .10
Shoe		
Unwashed	1.60	.06½ @ .06¾
Washed	1.50	.08½ @ .08¾
Tube		
No. 1	1.00	.09¾ @ .10
No. 2	1.10	.08¼ @ .08½
Truck Tire		
Truck tire, heavy gravity	1.55	.06¼ @ .06¾
Truck tire, light gravity	1.40	.06½ @ .07
Miscellaneous		
Mechanical blends....	1.60	.05 @ .05½

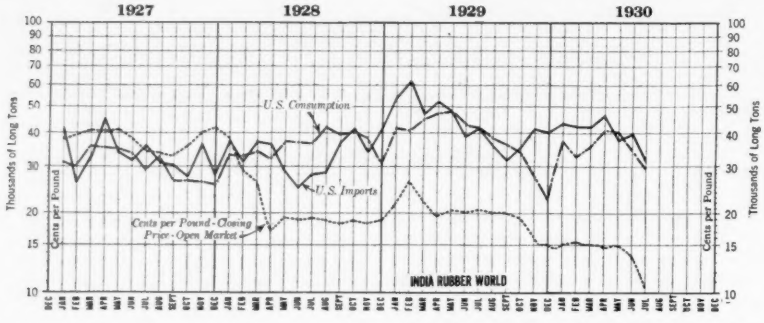
United States Reclaimed Rubber Statistics—Long Tons

Year	Production	Consumption	Consumption Per Cent to Crude	United States Stocks*	Exports
1925	132,930	137,105	35.6	13.203	4,571
1926	180,582	164,500	45 9	23,218	5,391
1927	189,144	178,471	47.6	24,980	8,540
1928	208,516	223,000	50.4	24,785	9.577
1929	219,057	224,253	47.9	27,464	12,721
1929					
January	18,685	21,068	49.1	24,394	941
February	18,094	19,829	47.7	23,305	1,028
March	19,984	20,068	46.7	22,076	1,344
April	19,899	21,574	47.3	20,680	1,498
May	20,385	23,176	47.1	19,479	1,299
June	18,416	18,141	42.0	17,980	961
July	18,387	20,236	48.7	19,679	1,202
August	19,787	18,230	47.6	22,309	860
September	18,660	16,416	47.2	24,984	657
October	18,968	18,024	51.8	25,474	830
November	14,363	14,742	53.4	26,080	1,232
December	13,429	11,089	47.1	27,464	869
1930					
January	15,010	16,785	45.8	24,241	954
February	15,847	14,918	45.5	24,241	1,203
March	17,400	15,616	43.2	24,415	1,048
April	17,828	17,321	43.0	24,592	740
May	17,812	17,473	43.7	23,356	939
June	15,745	14,410	41.6	24,484	641
July	12,320	12,688	42.3	23,870	†

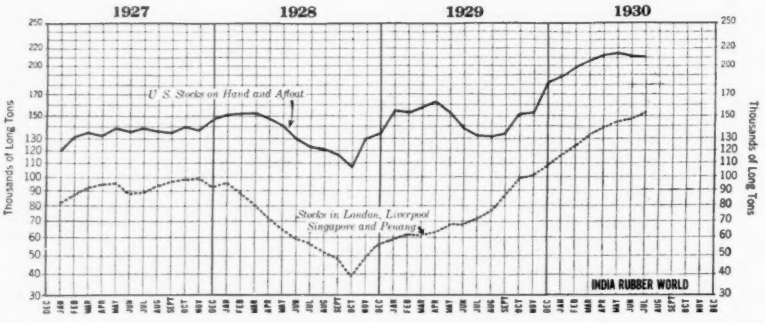
* Stocks on hand the last of the month or year.
† Not available.
Compiled by Rubber Manufacturers Association.

Imports, Consumption, and Stocks

THE topmost of the accompanying graphs represents the closing prices of actual spot ribbed smoked sheet transactions reported by the Rubber Trade Association of New York. In July there was a pronounced drop both in the tonnage imported and that consumed. Imports for that month were 30,970 tons, a decline of 8,791 from the imports for June. Consumption in July ran 29,894 tons or 4,749 tons less than for June.



United States Imports, Consumption, and Prices of Ribbed Smoked Sheets



United States, British and Malayan Rubber Stocks

The average monthly imports during the first six months of 1930 was 42,059 tons or a total of 252,353 tons. The average monthly consumption for the same period was 36,677 tons or a total of 220,061 tons. Even in April, the peak month of production of the first six months this year, consumption was 1,852 tons less than the monthly average of importations.

Henderson Rubber Reports, Inc., estimates August imports at 35,000 tons and consumption at 30,000 tons or virtually the same consumption as recorded for July. The same authority estimates the August imports at 35,000 tons, stocks afloat to the United States at 60,000 tons, and stocks on hand in the United States at 173,000 tons.

The curve of closing spot prices for ribs in the open market averaged 14 cents for the first six months of this year. Since the first of June the price has declined to the current level of practically 9½ cents a pound.

United States stocks of crude rubber on hand and afloat, also the combined London, Liverpool, Singapore, and Penang stocks are shown on the lower chart.

London and Liverpool stocks follow:

London Stocks

Week Ended	Tons
Aug. 2	80,379
Aug. 9	80,044
Aug. 16	80,224
Aug. 23	80,618

Liverpool Stocks

Week Ended	Tons
Aug. 2	28,404
Aug. 9	28,660
Aug. 16	29,048
Aug. 23	29,673

United States Statistics of Rubber Imports, Consumption, and Stocks

Twelve Months	*Net Imports Tons	Consumption Tons	Stocks on Hand Tons	Stocks Afloat Tons	Total Domestic Stocks Tons	British and Malayan Stocks: London & Liverpool Tons	British and Malayan Stocks: Singapore & Penang Tons	British and Malayan Stocks: Total Tons
1925	385,596	388,000	50,985	52,421	103,406	6,328	18,840	25,168
1926	399,972	366,000	72,510	51,238	123,748	51,320	26,443	77,763
1927	403,472	373,000	100,130	47,938	148,068	66,261	25,798	92,059
1928	407,572	437,000	66,166	68,764	134,930	22,603	32,905	55,508
1929	527,327	464,644	105,138	62,389	167,527	73,253	35,548	108,801
1930								
January	44,093	36,669	126,068	61,863	187,931	81,300	33,468	114,768
February	41,373	32,726	134,790	63,404	198,194	87,100	37,550	124,650
March	42,339	35,914	141,843	63,646	205,489	93,500	38,129	131,629
April	46,997	40,207	148,272	63,261	211,533	99,870	39,880	139,750
May	37,790	39,902	146,179	68,168	214,347	102,936	41,253	144,189
June	39,761	34,643	151,551	58,658	210,209	108,203	39,033	147,236
July	30,970	29,894	152,001	58,326	210,327	108,704	44,535	153,239

*Including liquid latex, but not guayule.

United States Crude and Waste Rubber Imports for 1930 by Months

	Plantations	Latex	Paras	Africans	Centrals	Guayule	Manicobas and Matto Grosso	Total 1930	Total 1929	Balata	Miscellaneous	Waste
January ..... tons	46,042	362	747	76	10	125	...	47,362	52,305	127	748	35
February	42,510	275	788	66	14	75	...	43,728	64,538	130	543	144
March	44,002	332	894	37	15	150	...	45,430	53,824	123	738	20
April	48,727	179	881	53	12	75	...	49,927	54,171	87	628	107
May	39,620	444	530	...	1	150	...	40,745	49,180	109	909	87
June	41,631	314	492	...	128	88	...	42,653	44,490	127	829	2
July	33,207	193	489	36	...	159	...	34,084	44,252	104	525	11
Total, seven months, 1930 ..... tons	295,739	2,099	4,821	268	180	822	...	303,929	.....	807	4,920	406
Total, seven months, 1929 ..... tons	*354,353	....	7,582	211	249	352	13	.....	362,760	573	7,830	1,898

*Latex included.

Compiled from Rubber Manufacturers Association statistics.

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25 lb package

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"Disperso" Carbon Black has met the demands for better dispersion in the batch . . . improved ageing qualities . . . saved milling time . . . a Carbon Black tremendously increasing the tensile strength of rubber.

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◆

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Compounding Ingredients

SUPPLIERS of the more important items of compounding ingredients report a distinct improvement in consuming demand in August over that for July. This coincides with the tendency in Akron district to increase tire production schedules. While these schedules do not average over 50 to 60 per cent of capacity, they are on the upgrade and advancing.

In mechanical rubber goods and other lines of rubber manufacturing, production is steady at a moderate rate. The fall outlook indicates a better demand for rubber goods for personal use, particularly footwear and weatherproof clothing.

Rubber manufacturers are concentrating on particular grades of organic material to accomplish desired results. Thus all organic chemicals find a ready sales response in the trade.

ACCELERATORS. A distinct, although moderate improvement in demand is noted by the shipments of the more popular accelerators the past month. The necessity of conserving resources by reduction of inventory of supplies has induced restriction of variety in compounded stocks and promoted their simplification by standardization on the use of fewer varieties of accelerators.

ANTIOXIDANTS. Trade in antioxidants like that in accelerators is very well sustained. The value to the rubber manufacturer of antioxidants lies in their ability to preserve the life and quality of his products when chosen and used with reference to service conditions to be met by the goods.

Thus it is a fact that accelerators, antioxidants, and special chemicals are being used in a constantly increasing number of places and this new business helps distinctly to offset any reduction due to depression in the industry.

CARBON BLACK. Offerings of some "distress" black lots were reported late in July. Owing to fierce competition occasioned by overproduction the carbon black market has become demoralized, and prices are the lowest in ten years.

CLAY. This material is in favor as the cheapest reenforcing material available. The demand is steady and in good tonnage because of the adaptability of the material to general use.

LITHARGE. Consuming demand has been moderate on hand-to-mouth order. On August 11 the price advanced ¼-cent a pound because of the upward movement in the cost of pig lead. The increase, however, made no impression on the rate of consumption.

LITHOPONE. Demand has fallen to a slow rate with prices steady and unchanged.

MINERAL RUBBER. The business is keenly competitive. The best grades are available at moderate rates and more satisfactory to use in quality compounding.

Inferior grades of mineral rubber are quoted at very low prices. This situation is unwarranted since most companies using MR are not averse to paying higher prices for better goods.

SOFTENERS. Softeners and stabilizers for rubber compounding are well established as essentials and offered in types suited to specific compounding needs. This leads to steady sales movement of all the individuals in the list.

VMP NAPHTHA. Reduced, slow, and spotty demand continued to characterize August demand for this material in the rubber industry. Prices held firm and unchanged.

ZINC OXIDE. Prices hold steady and unchanged as set in 1926. The demand is moderate and steady by the industry.

New York Quotations

August 26, 1930

Abrasives

Marble flour	ton	$15.00 @	$25.00
Pumice stone, pwd.	lb.	.02½ @	.04
Rottenstone, domestic	ton	23.50 @	28.00
Rottenstone, English	lb.	.04 @	.05
Silica	lb.	.01¼ @	.05

Accelerators, Inorganic

Lead, carbonate	**lb.**	**.07¼ @**	
red	lb.	.09 @	
sublimed blue	**lb.**	**.07¼ @**	
sublimed white	**lb.**	**.07¼ @**	
super-sublimed white	**lb.**	**.07¼ @**	
Lime flour, hydrated	ton	20.00 @	35.00
Litharge	lb.	.08 @	
Magnesia, calcined, heavy	lb.	@	
carbonate	lb.	.06 @	.07
Orange mineral A.A.A.	lb.	.11 @	

Accelerators, Organic

A-1	**lb.**	**.22 @**	**.27**
A-5-10	**lb.**	**.31 @**	**.36**
A-7	**lb.**	**.55 @**	**.65**
A-11	**lb.**	**.62 @**	**.75**
A-16	**lb.**	**.57 @**	**.65**
A-19	lb.	.58 @	.75
A-32	lb.	.70 @	.80
Accelerator 49	lb.	.36 @	.41
Aldehyde ammonia	lb.	.65 @	.70
Barak	lb.	@	
Butene	lb.	@	
Captax	**lb.**	**@**	
Crylene	**lb.**	@	
paste	**lb.**	@	
D. B. A.	lb.	@	
D. O. T. G.	lb.	.42 @	.47
D. P. G.	lb.	.30 @	.35
Ethylidine aniline	lb.	.45 @	.47½
Formaldehyde aniline	lb.	.37½ @	.40
Heptene	lb.	@	
base	lb.	@	
Hexamethylenetramine	lb.	.58½ @	.61
Lead oleate, No. 999	lb.	.14½ @	
Witco	lb.	@	
Lithex	**lb.**	**@**	
Monex	**lb.**	**@**	
Phenex	**lb.**	**.70 @**	**.75**
Pinsol	lb.	4.00 @	4.50
Plastone	**lb.**	**@**	
R-2	lb.	1.75 @	2.15
base	lb.	4.50 @	5.00
R & H 40	lb.	.40 @	.42½
50	lb.	.40 @	.42½
397	lb.	.75 @	.77½
Safex	lb.	@	
S-P-D-X	lb.	.70 @	.75
Super-sulphur No. 1	**lb.**	**@**	
No. 2	**lb.**	**@**	
Tensilac 39	lb.	.40 @	.42½
Thermlo F	**lb.**	**@**	
Thiocarbanilid	lb.	.26½ @	.28½
Trimene	**lb.**	**@**	
base	lb	@	
Triphenyl guanidine	lb.	.58 @	.60
Tuads	**lb.**	**@**	

Accelerators, Organic *(Continued)*

Ureka	lb.	$0.70 @	$1.00
V. G. B.	**lb.**	**@**	
Z. B. X.	lb.	@	
Z-88	lb.	.50 @	.60
Zimate	lb.	@	

Acids

Acetic 28% (bbls.)	100 lbs.	3.11 @	3.36
glacial (carboys)	100 lbs.	11.51 @	11.76
Sulphuric, 66°	ton	15.50 @	

Alkalies

Caustic soda, 76% solid	100 lbs.	2.90 @	3.00

Antioxidants

Age-Rite, powder	lb.	@	
resin	**lb.**	**@**	
white	**lb.**	**@**	
Albasan	lb.	@	
Antox	**lb.**	**@**	
Oxynone	lb.	.68 @	.90
Resistox	lb.	.54 @	.65
Stabilite	lb.	.57 @	.62
Alba	lb.	.70 @	75
Zalba	lb.	@	

Antisun Materials

Heliozone	lb.	@	
Sunproof	lb.	@	

Binders, Fibrous

Cotton flock, dark	lb.	.09 @	.10¼
dyed	lb.	.50 @	.70
white	lb.	.12 @	.24

Colors

BLACK

Bone	lb.	.08½ @	
Carbon (see Reenforcers)			
Drop (bbls.)	**lb.**	**.05½ @**	**.15**
Lampblack (commercial)	**lb.**	**.07 @**	**.08**

BLUE

Huber, brilliant	lb.	3.50 @	4.00
Prussian	**lb.**	**.35 @**	**.37**
Ultramarine	**lb.**	**.06 @**	**.30**

Colors *(Continued)*

BROWN

Huber, mocha	lb.	$1.60 @	$2.10
Iron oxide	lb.	.03 @	.20
Mapico	lb.	.17 @	
Sienna, Italian, raw	lb.	.05½ @	.12½

GREEN

Chrome, light	lb.	.27 @	.31
medium	**lb.**	**.28 @**	**.31**
Chromium oxide	lb.	.25 @	.33
Huber, brilliant	**lb.**	**3.75 @**	**4.25**

ORANGE

Cadmium sulphide	lb.	.90 @	1.00
Huber, Persian	**lb.**	**.50 @**	**1.00**

RED

Antimony			
Crimson, R. M. P. No. 3	**lb.**	**.48 @**	
Sulphur free	lb.	.52 @	
7-A	**lb.**	**.35 @**	
Z-2	**lb.**	**.22 @**	
Cadmium	lb.	1.15 @	
Huber, brilliant	lb.	1.35 @	1.85
Iron Oxides			
bright pure domestic	lb.	.11 @	
bright pure English	lb.	.12 @	.14
bright reduced English	lb.	.09 @	.11
bright reduced domestic	lb.	.08 @	
Indian (maroon), pure domestic	lb.	.10 @	
Indian (maroon), pure English	lb.	.10 @	.11
Indian (maroon) reduced English	lb.	.08 @	.09½
Indian (maroon) reduced domestic	lb.	.08 @	
Mapico	lb.	.10¾ @	
Oximony	lb.	.13½ @	
Spanish red oxide	lb.	.02¾ @	.04
Sunburnt red	**lb.**	**.14 @**	
Venetian red	lb.	.02 @	.06

WHITE

Lithopone	lb.	.05½ @	.05¾
Albalith	**lb.**	**.05¼ @**	**.05½**
Azolith	**lb.**	**.05¼ @**	**.05¼**
Cryptone	lb.	.07¼ @	.07½
Grasselli (50 lb. bags)	**lb.**	**.05¼ @**	**.05¼**
(400 lb. bbls.)	**lb.**	**.05½ @**	**.05¼**
Titanium oxide, pure	lb.	.20 @	.22
Titanox "B"	lb.	.07¼ @	.07¾
"C"	lb.	.07¾ @	.08¼

Colors—(Continued)

WHITE—(Continued)

Zinc Oxide

AAA (lead free) (bbls.)	lb.	$0.07	@
Azo (factory):			
ZZZ (lead free)	lb.	.06½	@ .07
ZZ (leaded)	lb.	.06¼	@ .06½
Z (8% leaded)	lb.	.06¼	@ .06¾
Green seal	lb.	.10⅜	@ .10⅝
Kadox, black label	lb.	.10⅜	@ .10¾
blue label	lb.	.09⅜	@ .09¾
red label	lb.	.08	@ .08¼
Red seal	lb.	.09⅜	@ .09⅝
Special	lb.	.07	@ .07½
White seal	lb.	.11⅜	@ .11¾
XX green	lb.	.07	@ .07¼
XX red	lb.	.06½	@ .06¾
Zinc sulphide	lb.	.16	@ .16¼

YELLOW

Cadmium sulphide	lb.	.65	@ 1.40
Chrome	lb.	.17	@ .17¼
Huber, canary	lb.	2.80	@ 3.30
Mapico	lb.	.12	@
Ochre, domestic	lb.	.01½	@ .02½
French	lb.	.03	@
Oxide, pure	lb.	.09	@
Zinc, C. P., imported	lb.	.21	@

Factice—See Rubber Substitutes

Fillers for Pliability

Flex	lb.		@
Fumonex	lb.	.04	@ .08
P-33	lb.		@
Thermax	lb.		@
Velvetex	lb.	.03	@ .06

Fillers, Ordinary

Asbestine	ton	13.40	@13.50
Baryta white (f.o.b. St. Louis, bbls.)	ton	23.00	@
(f.o.b. St. Louis, paper bags)	ton	22.20	@
Barytes, pure white	ton	35.00	@40.00
off color	ton		@
medium	ton		@
Foam "A" (f.o.b. St. Louis, bbls. and bags)	ton	23.00	@
Basofor	lb.	.04½	@
Blanc fixe, dry	lb.	.04½	@
pulp	ton	42.50	@45.00
Infusorial earth	ton	40.00	@50.00
Slate flour, gray (fact'y)	ton	7.00	@

Whiting

Domestic	100 lbs.	1.00	@
Imported chalk	100 lbs.	.75	@ 1.50
Paris White, English cliffstone	100 lbs.	1.20	@ 1.75
Quaker	ton		@
Sussex	ton		@
Witco (l. c. l.) (f.o.b. New York)	ton		@

Finishes

Mica, amber	lb.		@
Shellac, fine orange	lb.	.60	@
Starch, corn, pwd.	100 lbs.	3.77	@ 3.97
potato	lb.	.05½	@ .06
Talc, domestic	lb.	.01¼	@
dusting	lb.	.01½	@ .04
French	ton	18.00	@22.00
Pyrax A	ton		@

Inflating Material

Ammonium carb., pwd.	lb.	.10	@ .10½
lump	lb.	.09½	@ .10

New York Quotations

August 26, 1930

Mineral Rubber

Fluxrite (solid)	lb.		@
Genasco (fact'y)	ton	$40.00	@$42.00
Gilsonite (fact'y)	ton	37.14	@39.65
Granulated M. R.	ton		@
Hydrocarbon, hard	ton		@
Ohmlac Kapak, M. R. (f.o.b. fact'y)	ton	60.00	@
M. 4 (f.o.b. fact'y)	ton	175.00	@
Paradura (fact'y)	ton	62.50	@65.00
Parmr Grade 1	ton	28.00	@
Grade 2	ton	28.00	@
Pioneer, M. R., solid fact'y	ton	40.00	@42.00
M. R. granulated	ton	50.00	@52.00
Robertson, M. R., solid (fact'y)	ton	34.00	@80.00
M. R. granulated	ton	38.00	@80.00

Mold Lubricants

Rusco mold paste	lb.	.12	@ .30
Soapbark (cut)	lb.	.09	@ .10
Soapstone	ton	15.60	@22.00

Oils

Kerosene	gal.	.11½	@
Mineral	gal.	.20	@
Poppy seed oil	gal.	1.70	@
Rapeseed	gal.	.63	@
Red oil, distilled	lb.	.09½	@ .09¾
Rubber process	gal.	.25	@
Spindle	gal.	.30	@

Reenforcers

Aluminum flake (sacks, c.l.)	ton	21.85	@
(sacks, l.c.l.)	ton	24.50	@
Carbon Black			
Aerfloted arrow	lb.	.05	@ .10
Century (works, La., c. l.)	100 lbs.		@
Disperso (works, La., c. l.)	100 lbs.		@
Excello	lb.	.04½	@
Gastex (f. o. b. fact'y)			
contracts	lb.	.04	@
carload	lb.	.04	@
less carload	lb.	.05¼	@ .07½
Micronex	lb.	.05	@ .10
Ordinary (compressed or uncompressed)	lb.	.04½	@ .09
Palmer gas black	lb.	.04½	@
Supreme	lb.	.04½	@
Clays			
Bento	lb.	.02½	@ .03
Blue Ridge, dark	ton		@
China	lb.	.01¼	@
Dixie	ton		@
Dusto	lb.	.05	@ .07
Langford	ton		@
Lexo (works)	ton	8.00	@
Par	ton		@
Perfection	ton		@
Suprex	ton	8.00	@20.00
Glue, high grade	lb.	.27	@ .35

Rubber Substitutes or Factice

Amberex	lb.	.15	@
Black	lb.	.08	@ .12
Brown	lb.	.08	@ .13
White	lb.	.08	@ .15

Softeners

Burgundy pitch	100 lbs.	6.00	@
Atlas	100 lbs.	6.50	@
Corn oil, crude	lb.	.09½	@
Cottonseed oil (P. S. Y.)	lb.	.09½	@
Coumarone resins	lb.		@
Cycline oil	lb.	.25	@ .34
Degras	lb.	.03¼	@ .04½

Softeners (Continued)

Fluxol	ton	$18.00	@$80.00
Fluxrite (fluid)	lb.		@
Laurex, ton lots	lb.		@
Palm oil (Lagos)	lb.	.07½	@
(Niger)	lb.	.07	@
(Witco)	lb.		@
Para-flux	gal.	.15	@ .17
Petrolatum, snow white	lb.	.08	@ .08¾
Pigmentar	gal.	.16	@ .21
Pigmentaroil (tank cars, factory)	gal.	.15	@
(bbls., drums)	gal.	.20	@
Pine oil, dest distilled	gal.	.50	@ .55
Pine pitch	bbl.	7.00	@
Pine tar (retort)	bbl.	13.50	@13.75
Rosin K (bbls.)	280 lbs.	6.07½	@
Rosin oil compounded	gal.		@
No. 3, deodorized	gal.	.57	@
No. 556, deodorized	gal.	.48	@
Rubberseed, drums	lb.	.09½	@
Rubtack	lb.		@
Stearex	lb.	.13	@ .18
Stearic acid, double pressed	lb.	.13½	@ .14
Tackol	lb.	.09	@ .18
Tonox	lb.		@
Witco No. 20	gal.		@
Woburn oil	lb.	.05½	@ .06
Wobonite No. 94	lb.	.03½	@

Solvents

Benzol (90% drums)	gal.	.26	@
Carbon bisulphide (drums)	lb.	.05½	@ .12
tetrachloride (drums)	lb.	.06½	@ .12
Dip-Sol	gal.	.12	@
Dryolene, No. 9	gal.	.09½	@
Gasoline			
No. 303			
Drums, c. l.	gal.	.20	@
Tankcars	gal.	.16	@
Rub-Sol	gal.	.08	@
Solvent naphtha (tanks)	gal.	.28	@
Stod-Sol	gal.	.09	@
Turpentine, Venice	lb.	.20	@
dest distilled	gal.	.34	@

Vulcanizing Ingredients

Sulphur

Rubber sulphur	100 lbs.	1.75	@ 2.60
Soft rubber (c.l.)	100 lbs.		@
(l.c.l.)	100 lbs.		@
Sulphur chloride	lb.	.03½	@ .04
Superfine commercial flour (bbls.)	100 lbs.	2.55	@ 3.10
(bags)	100 lbs.	2.20	@ 2.80
Tire brand, superfine, 100 lbs.		1.75	@
Tube brand, velvet.	100 lbs.	2.30	@
Velvet flour (240 lb. bbls.)	100 lbs.	2.95	@ 3.50
(150 lb. bags)	100 lbs.	2.60	@ 3.15
Vandex	lb.		@

(See also Colors—Antimony)

Waxes

Beeswax, white, commercial	lb.	.55	@
carnauba	lb.	.33	@
ceresin, white	lb.	.12½	@
montan	lb.	.06½	@
ozokerite, black	lb.	.28	@
green	lb.	.28	@

Paraffin

122/124 crude, white scale	lb.	.03¼	@
124/126 crude, white scale	lb.	.03¼	@
125/127 fully refined	lb.	.04¼	@

Miscellaneous Supplies

Bentonite (dispersion clay)	lb.	.02½	@ .03
Sponge paste	lb.	.30	@

Netherlands East Indies Exports

Crude Rubber Exports During the First Six Months of 1929 and 1930

Long Tons

	Java and Madura		Sumatra East Coast		Other Netherlands East Indies		Total	
	1929	1930	1929	1930	1929	1930	1929	1930
January	5,640	5,709	8,067	7,831	11,535	8,920	25,242	22,460
February	6,572	6,900	7,510	7,191	10,531	11,414	24,613	25,505
March	5,515	5,796	6,620	6,612	10,698	11,070	22,833	23,478
April	5,997	4,802	6,645	6,326	11,280	12,582	23,922	23,710
May	6,263	6,352	6,961	6,661	13,438	11,916	26,662	24,929
June	5,582	4,728	6,693	4,776	11,270	9,512	23,545	19,016
Total	35,569	34,287	42,496	39,397	68,752	65,414	146,817	139,098

Compiled by Rubber Division, Department of Commerce, Washington, D. C.

"NON-DISCOLORING"

What does it mean in antioxidants?

CHOOSE *from these three* **DU PONT** *products the one most suited to your particular needs*

DU PONT REG. U. S. PAT. OFF.

ANTOX . . . causes some discoloration, but not so much as to prevent its use in many colored stocks. It is more effective than any of the antioxidants that discolor less, and is especially recommended for bus and truck tubes because of its heat-resisting qualities.

DU PONT REG. U. S. PAT. OFF.

ZALBA . . . causes a little discoloration on exposure to sunlight—much less than Antox. It is a less powerful antioxidant than Antox, but more effective than Parazone. Zalba is used in colored products and in white sidewalls also, although it does cause a slight degree of "sun-tan" after prolonged exposure.

DU PONT REG. U. S. PAT. OFF.

PARAZONE is a strictly non-discoloring antioxidant, but is less effective than either Zalba or Antox. It causes no discoloration whatever, regardless of how long the rubber article may be exposed to sunlight. We recommend it for pure white stocks only.

Economy demands that you choose the right "non-discoloring" antioxidant. Use Parazone only in compounds for which Zalba is not suitable. Use Antox wherever its degree of discoloration will permit. It is the most effective.

DU PONT REG. U. S. PAT. OFF.

Fine Rubber Chemicals

E. I. DU PONT DE NEMOURS & COMPANY, INC. RUBBER CHEMICALS SECTION WILMINGTON, DELAWARE

J. H. LANE & CO.

250 West 57th Street
NEW YORK

323 South Franklin Street
CHICAGO

TIRE FABRICS—CORD FABRIC—JACKET CLOTH
WIDE COTTON FABRICS — ENAMELLING DUCK
DRILL — SHEETING — OSNABURG

SPECIAL CONSTRUCTIONS FOR RUBBER TRADE

Callaway Mills

INCORPORATED

345 Madison Ave. New York

Cord Fabric
Builder Fabric
Chafer Fabric
Sheeting

HOSE AND BELT DUCK

Special Fabric for the Rubber Trade

Boston Representative
M. R. Abbott
110 Summer St.

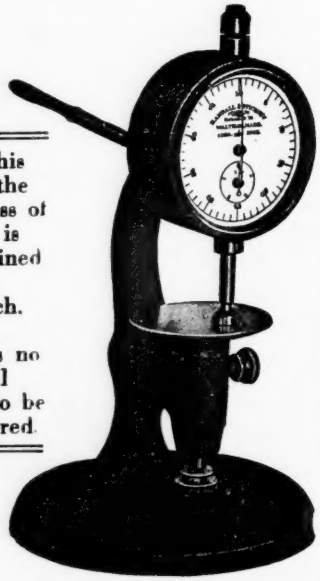
Chicago Representative
Ray T. Johnson
323 S. Franklin St.

Akron Representative
L. A. Watts, Second National Bldg.

Atlanta Representative
Harry W. Callaway, 1308 Rhodes-Haverty Bldg.

The Efficiency Rubber Gauge

(The Randall and Stickney Thickness Gauge)



With this Gauge the thickness of rubber is determined within .001 inch. and there is no personal factor to be considered.

This instrument has been in use by the leading Rubber Manufacturers of this country and Canada for fifteen years.

Operated by a Standard Pressure on a Standard Area

Send for Descriptive Circular and Prices

FRANK E. RANDALL Waltham, Mass.

New York Quotations

August 26, 1930

Drills

38-inch 2.00-yard	*yard*	$0.12½ @
40-inch 3.47-yard		.07¼ @
50-inch 1.52-yard		.17¼ @
52-inch 1.90-yard		.13¾ @
52-inch 2.20-yard		.12 @
52-inch 1.85-yard		.14½ @

Ducks

38-inch 2.00-yard D. F.	*yard*	.13½ @
40-inch 1.45-yard S. F.		.18½ @
72-inch 1.05-yard D. F.		.28½ @
72-inch 16.66-ounce		.32 @
72-inch 17.21-ounce		.33½ @

MECHANICAL

Hose and belting	*pound*	.29 @

TENNIS

52-inch 1.35 yard	*yard*	.20 @

Hollands

RED SEAL

36-inch	***yard***	**.14 @**
40-inch		**.15 @**
50-inch		**.19½ @**

GOLD SEAL

40-inch, No. 72	***yard***	**.18½ @**
40-inch, No. 80		**.19½ @**

Osnaburgs

40-inch 2.35-yard	*yard*	.11¼ @
40-inch 2.48-yard		.10½ @
40-inch 3.00-yard		.08⅞ @
40-inch 10-oz. part waste		.13 @
40-inch 7-oz.		.09⅝ @
37-inch 2.42-yard		.10¾ @

Raincoat Fabrics

COTTON

Bombazine 64 x 60	*yard*	.10 @
Bombazine 60 x 48		.09 @
Plaids 60 x 48		.10¾ @
Plaids 48 x 48		.12 @
Surface prints 64 x 60		.12½ @
Surface prints 60 x 48		.11 @
Print cloth, 38½-in., 60 x 48		.04½ @
Print cloth 38½-in., 64 x 60		.05½ @

Sheetings, 40-inch

48 x 48, 2.50-yard	*yard*	.08⅞ @
48 x 48, 2.85-yard		.07⅞ @
64 x 68, 3.15-yard		.08¾ @
56 x 60, 3.60-yard		.07½ @
44 x 48, 3.75-yard		.06⅝ @
44 x 40, 4.25-yard		.05¾ @

Sheetings, 36-inch

48 x 48, 5.00-yard	*yard*	.05⅛ @
44 x 40, 6.15-yard		.04 @

Tire Fabrics

SQUARE WOVEN 17¼-ounce

Peeler, karded	*pound*	.40 @

BUILDER 23/11

Peeler, karded	*pound*	.40 @

BUILDER 10/5

Peeler, karded	*pound*	.37 @

CORD 23/5/3

Peeler, karded	*pound*	.40 @

CORD 23/4/3

Peeler, karded	*pound*	.42 @

CORD 23/3/3

Peeler, karded	*pound*	.45 @

CORD 15/3/5

Peeler, karded	*pound*	.38 @

CORD 13/3/3

Peeler, karded	*pound*	.37 @

LENO BREAKER

8-oz. Peeler, karded	*pound*	.40 @
10-oz. Peeler, karded		.40 @

CHAFER

9.5-oz. Peeler, karded	*pound*	.43 @
12-oz. Peeler, karded		.42 @
14-oz. Peeler, karded		.40 @

Cotton and Fabrics

IN VIEW of the controversy over the activities of the Federal Farm Board, the remarks of former President Coolidge in the *Herald Tribune* on July 30 are significant:

"The European cartel for maintaining an arbitrary price for steel has been abandoned. The plan failed. Some years ago our government was trying to fix a price for silver. More recently the British were trying to control rubber. In Brazil it was coffee, in Cuba sugar, and in Canada the wheat market. Our producers tried to hold the price of copper, and the Farm Board went into wheat and cotton.

"None of these efforts has been a success. It is not possible to repeal the law of supply and demand, of cause and effect, or of action and reaction. . . . .

COTTON BULL POINTS

1. **Crops in uplands of drought area were seriously damaged.**
2. **Sales in July were 108.6 per cent of production, against 65.5 per cent in June.**
3. **Mills are extending curtailment efforts.**
4. **Production is being brought in line with demand.**
5. **Cotton is comparatively cheap; while manufacturers are still pursuing a hand-to-mouth policy when buying.**
6. **Invisible stocks in distributers' and consumers' hands have been drawn down nearly to the vanishing point.**
7. **Foreign carryover of American cotton is the smallest in many years, at 1,750,000 bales.**

COTTON BEAR POINTS

1. **A reduction of about a million bales in domestic consumption and of another million in exports resulted in a carryover in the United States officially stated to be 4,530,583 bales against 2,311,988 a year ago.**
2. **Stocks of goods at mills are larger, and unfilled orders are relatively smaller.**
3. **Ginnings are largest on record, except 1925.**
4. **Probability of heavy hedging exists and doubt as to its absorption.**
5. **Cotton spinning industry during July operated at 67.4 per cent capacity on a single shift basis, compared with 76.3 in June, this year, and 100.2 per cent in July, last year.**
6. **Average active spinning spindles of those in place during July were 22,944,203, compared with 26,029,389 in June, this year, and 24,883,979 in July, last year.**
7. **An average of 156 hours of activity for spindles in place was maintained for July, compared with an average of 169 in June, 1930, and an average of 222 in July, 1929.**

"When the consumer buys a product, it goes out of the market and disappears. When private or public agents buy to fix an arbitrary price, the product is still in the market; every consumer knows it and waits for the resale. The price can be held only as a local or temporary expedient, which usually makes matters worse. But because all of us are bigger than some of us, not even the United States Treasury is powerful enough to put an arbitrary price on the great world staples with any permanent success."

The activities of the Farm Board have already caused regret in some quarters, and the excess cotton, of which the cooperatives have more than 800,000 bales, is a drug on the market.

The government crop report issued of August 8 started a bearish movement lasting ten days. The condition of the crop, however, is subject to radical changes from the period last reported on and the close of the marketing season. While the bears have been forcing cotton prices to new low levels, the situation is not without its brighter side. In the report of August 15, Geo. H. McFadden & Bro. declared:

"In spite of the fact that today we actually broke through the low point of the market reached during the crop year of 1926, bull speculative interest is still entirely lacking.

"About the only encouraging comment that can be made at this time is that both trade and speculative short interests are being rapidly built up in the futures market."

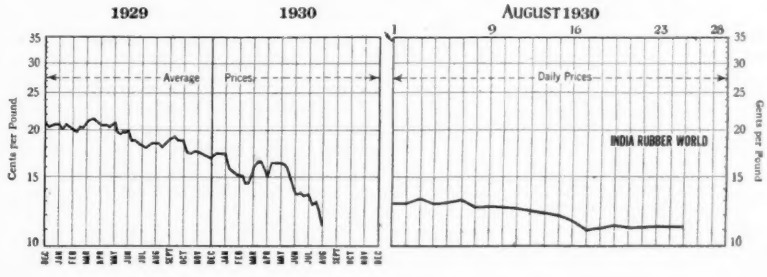
Another important point to remember is that cotton is extremely cheap. In 1926 the crop was 18,000,000 bales, and when the world recognized that cotton was cheap, it rose from 11.55 cents on December 4 to 18.06 at the end of the season.

Conditions are different now, but cotton is still a basic necessity, and the slightest factors may turn the tide at any time.

Week ended August 2: The bears marked the close of the 1929-30 season by sending cotton to the lowest levels in several years. Declines of $1 a bale on the last day sent all deliveries to levels not equaled since 1926. Large operators were credited with selling actively to force prices to a level that would enable them to cover at a profit in advance of the coming report of the Census Bureau. The gains registered toward the end of the week were ascribed to covering transactions by the same interests.

At Memphis the all-time record of seventy-six days' duration of the drought was equaled. Growers in the Mississippi Valley estimate a reduction of from 10 to

Daily Prices of Spot Middling Upland Cotton



20 per cent. If the present rate of maturity is maintained, picking will be in full swing by August 20 all through the Delta, which is almost unheard of. Such a situation will mean reduced yields as a whole and material damage to the staple. Replanted cotton of the Delta is almost beyond redemption as none of it has received any rain at all. Only a quarter of an inch has been registered at Memphis since the middle of May, and the weather bureau has to have half an inch to record it.

Arkansas is hardest hit by the drought. Southeast Missouri's crop, on the other hand, is doing splendidly, with promise of a bumper yield, while west Tennessee may produce 500,000 bales for another large crop. Prices at the close on August 2 were:

Position	High	Low	Close	Yesterday's Close
Oct.	12.99	12.88	12.90/92	12.85
Oct.	12.78	12.60	12.64/65	12.60
Dec.	13.17	13.03	13.09	13.03/06
Dec.	12.92	12.75	12.83/84	12.76/78
Jan.	13.28	13.15	13.16/17	13.13/14
Jan.	13.00	12.87	12.92	12.86/87
Mar.	13.19	13.04	13.11	13.05
May	13.31	13.18	13.25	13.20/21

Week ended August 9: The Federal report issued on August 8 was a disappointment to the trade. The government estimate of a crop of 14,362,000 bales was a larger total than had been expected, and that fact, combined with predictions of rain that would end the drought, caused a break of $4 a bale in cotton.

The estimated crop is 1,000,000 bales larger than last year's total consumption. Adding this to the 6,000,000 bales that will be carried over was not encouraging. The government's figures, of course, were as of August 1, and the drought in the central and western belt has certainly reduced the output.

The weevil has been checked in Mississippi, but shedding, wilt, and prematurity of plant have caused heavy damage. Southeast Missouri and west Tennessee crops, however, are doing well although rain is needed. The Alabama crop needs rain but not nearly so much as does Arkansas, Louisiana, and Mississippi. Another menace threatens Arkansas, Tennessee, Louisiana, and Mississippi in the form of the army worm. If its advance is not checked by poison, serious damage may be the result in the next two or three weeks. Prices at the close on August 9 follow:

Position	High	Low	Close	Yesterday's Close
Oct.	12.63	12.48	12.61	12.56/58
Oct.	12.37	12.20	12.36/37	12.32/33
Dec.	12.77	12.63	12.75/76	12.69/72
Dec.	12.54	12.38	12.53/54	12.49/51
Jan.	12.83	12.70	12.83	12.78/80
Jan.	12.64	12.49	12.63/64	12.60/61
Mar.	12.83	12.65	12.83	12.76/77
May	12.98	12.85	12.96/98	12.93

Week ended August 16: Although the drought in the central and western belts was relieved by only light showers, the weather news could not support prices. From early in the week prices slid to lower and lower levels until figures were reached that represented the lowest figures in the life of all the present active contracts, and quotations for spots and futures were lower than for many years.

On Friday the figures of the United States Census Bureau were published, estimating that consumption of cotton by mills in the United States during the month of July would be 378,835 bales, compared with 405,000 bales consumed in June, 1930, and 547,000 bales in July a year ago. Total consumption for the twelve months ended July 31 was estimated at 6,113,932 bales against 7,091,065 in the corresponding period of 1928-29.

WEEKLY AVERAGE PRICES OF MIDDLING COTTON

Week Ended	Cents per Pound
Aug. 2	12.67
Aug. 9	12.86
Aug. 16	12.10
Aug. 23	11.19

Another cause of price decline was the statement of Carl Williams, member of the Farm Loan Board, who said that prices would go lower owing to the large surplus, which will be augmented by the present crop.

The first bales being ginned at Memphis reveal that the drought has caused considerable damage to the staple, and complaints of low grades from Clarksdale and Corinth, Miss., and Blytheville, Ark., were received the latter part of the week. Ginning will become general by next week unless the weather becomes very cool.

It was expected that a "drought report" would be issued from Washington this week, but on Thursday a wire from Washington, reading as follows, was received: "Regarding drought report—the data is not suitable to be given out on the wire."

When the decision not to publish details of the report was made known, the market broke sharply. Prices at the close on August 16 were:

Position	High	Low	Close	Yesterday's Close
Oct.	11.77	11.58	11.59	11.90
Oct.	11.50	11.34	11.34/35	11.66/67
Dec.	11.93	11.77	11.77	12.10/11
Dec.	11.66	11.51	11.51/52	11.84/87
Jan.	12.02	11.85	11.90	12.18
Jan.	11.76	11.62	11.62/64	11.95/97
Mar.	11.94	11.82	11.83/84	12.12/13
May	12.13	11.98	11.98/12	12.31/33

Week ended August 23: The selling movement, which began with the publication of the government crop report early in the month, became most aggressive on Monday. Prices for all months made new records for the movement and reached the lowest levels recorded in the trading on the New York Cotton Exchange since July contracts sold at 10.45 cents in June, 1921. The next day the decline, which had been unbroken for ten days, was arrested, and the list showed gains of 14 to 22 points. For the rest of the week the market was irregular, responding just as readily to either bull or bear news, closing at levels that were not much higher than those at the opening of the week.

Hedging operations are becoming a strong factor in the market. Toward the end of the week sufficient buying power was in evidence to relieve the market of pressure and covering by short interests. Hedge selling in Liverpool was absorbed by continental and Bombay selling at the decline. Cables from that city also stated that there was an improved cloth demand in Manchester with the India boycott less severe.

Rains during the week greatly benefited cotton in the drought area especially in the lowlands. Upland cotton was already so badly damaged that it had little effect. The crop yield has been reduced from 10 to 30 per cent in the Mississippi Valley, the greater reduction being in the hills and in a few isolated regions, where it will probably run as high as 50 per cent.

The weekly weather and crop summary was the reverse of bearish. It reported continued deterioration in the crop, insufficient rains to break the drought, shedding, blooming at the top, and premature opening of bolls. The report inspired a rally, but the final close showed a loss of more than $3 a bale, with a somewhat steadier undertone. Prices at the close on August 23 follow:

Position	High	Low	Close	Yesterday's Close
Oct.	11.31	11.08	11.20	11.15
Oct.	11.12	10.85	10.96/98	10.91/92
Dec.	11.43	11.22	11.32	11.31
Dec.	11.27	11.00	11.11/13	11.09/10
Jan.	11.46	11.31	11.46	11.42/43
Jan.	11.30	11.10	11.20/21	11.19/20
Mar.	11.58	11.27	11.36/38	11.34/36
May	11.68	11.45	11.58/59	11.51/53
July	11.77	11.62	11.74	11.69

On August 25 the market for spot cotton was 11.45 cents, 5 points down from the close of the 23rd. The tone of the market continues weak owing to the slackness of demand in the cotton textile industry and the probability that the available supply from the current crop and this year's carryover will total 18,000,000 bales, or 3,000,000 in excess of requirements.

Cotton Fabrics

DUCKS, DRILLS, AND OSNABURGS. The market for these fabrics has reflected a continued decline in price of raw material, and prices have reached a level that should prove attractive to large cloth users.

Cotton fabrics are on a selling basis at or below 10 cents for raw cotton, and it is expected that a more active and aggressive cotton textiles market will result in the near future. The bargain-counter prices are certain to enlist the interest of shrewd judges of value among purchasers.

RAINCOAT FABRICS. Business in raincoat fabrics is at present in precisely the same state as that in other trades. In other words it is fairly good one week and is very dull the week following, with only a few small scattered orders. A very good fall business is anticipated, however, as jobbers' and retailers' stocks of weatherproof garments are very low and it will require only a few good daytime rains to start retail sales' activity.

SHEETINGS. The market for sheetings continues rather inactive. Consuming demand is requisitioned on a hand-to-mouth basis for nearby delivery. The price movement follows very closely that of raw cotton. The expected fall revival of business in general industry should prove in marked contrast to the summer dullness and is confidently expected.

TIRE FABRICS. The curtailed tire production of tires is now giving way to higher production schedules. During August the market for both American and Egyptian fabrics ruled quiet with prices quiet and unchanged. Trading consisted of small to moderate poundages of foreign and domestic staples principally for nearby deliveries. Indications of fall activity have appeared in reported impending increases in the production schedules.

British Malaya

An official cable from Singapore to the Malayan Information Agency, Malaya House, 57 Charing Cross, London, S.W.1, England, gives the following figures for July, 1930:

RUBBER EXPORTS

Ocean Shipments from Singapore, Penang, Malacca, and Port Swettenham.

To:	July, 1930 Rubber Including Concentrated Latex Tons	Latex and Revertex Tons
United Kingdom	9,218	41
United States	24,470	117
Continent of Europe	5,534	158
British possessions	297	1
Japan	1,413	...
Other countries	98	...
Totals	41,030	317
Total Latex and Revertex	317	...
Grand total	41,347	...

RUBBER IMPORTS

Actual Imports by Land and Sea

From:	July, 1930 Dry Rubber Tons	Wet Rubber Tons
Sumatra	527	5,381
Dutch Borneo	382	3,961
Java and other Dutch islands	159	56
Sarawak	1,068	19
British Borneo	180	26
Burma	112	3
Siam	134	148
French Indo-China	492	26
Other countries	78	7
Totals	3,132	9,627

Ceylon Rubber Exports

January 1 to May 31, 1930

To:	Tons
United Kingdom	6,787.04
Continent	2,856.82
Other countries in Europe	32.04
Australia	826.12
America	21,425.28
Canada and Newfoundland	2.50
Other countries in America	64.73
Egypt	6.00
Africa	2.19
India	40.91
Japan	181.74
Other countries in Asia	1.29
Total	32,226.66
For the same period last year	31,979.17

Annual Exports, 1922-1929

	Tons
For the year 1929	80,476.44
1928	57,825.48
1927	55,355.77
1926	58,799.56
1925	45,697.19
1924	37,351.13
1923	37,111.88
1922	47,367.14

Low and High New York Spot Prices

Plantations	1930* August	1929 August	1928 August
Thin latex crepe	$0.10¼ @ $0.10⅞	$0.20⅞ @ $0.22½	$0.19¼ @ $0.20½
Smoked sheet, ribbed	.09¾ @ .10⅛	.19⅞ @ .21⅜	.18¾ @ .19⅞
Parás			
Upriver, fine	.13 @ .13¼	.21¼ @ .22½	.20½ @ .22¼
Upriver, coarse	.06½ @ ...	.11¼ @ .12¼	.13½ @ .15
Upper caucho ball	.06 @ .06½	.11¼ @ .12¼	.12¼ @ .13½

*Figured to August 26, 1930.

Tire Fabric and Hose Duck

United States Exports for Half Year Ended June 30, 1929, and 1930

Tire fabric	First 6 Months, 1929 Square Yards Thousands	First 6 Months, 1929 Value Thousands	First 6 Months, 1930 Square Yards Thousands	First 6 Months, 1930 Value Thousands
Cord	2,865	$1,328	761	$266
Other	630	211	288	105
Duck				
Heavy filter, paper dryer, hose and belting duck	277	176	213	133

World Rubber Shipments—Net Exports

Long Tons

British Malaya	Calendar Years 1928	1929	1930 Apr.	May	June	July
Gross Exports	409,500	579,524	43,813	49,488	36,657	41,347
Imports	149,787	161,612	14,627	13,253	12,120	12,759
Net	259,713	417,912	29,186	36,235	24,537	28,588
Ceylon	57,271	80,795	4,444	5,968	4,152	4,619
India and Burma	10,790	11,720	856	975	778	†
Sarawak	10,087	11,079	1,025	917	1,040	1,087
British No. Borneo	6,698	7,381	*600	*600	*600	*600
Siam	4,813	5,024	428	382	392	282
Java and Madura	58,848	66,010	4,802	6,352	4,728	†
Sumatra E. Coast	82,511	87,589	6,326	6,661	4,776	†
Other N. E. Indies	121,671	134,732	12,582	11,916	9,512	†
French Indo-China	9,616	10,147	433	753	425	648
Amazon Valley	21,129	21,148	1,201	1,383	974	810
Other America	1,490	996	97	83	83	†
Mexican Guayule	3,076	1,275	75	172	168	†
Africa	6,124	4,596	458	*300	*300	†
Totals	653,837	860,404	62,513	72,697	52,465	....

* Estimate. † Not available.
Compiled by Rubber Division, Department of Commerce, Washington, D. C.

World Rubber Absorption—Net Imports

Long Tons

Consumption	Calendar Years 1928	1929	1930 Mar.	Apr.	May	June
United States	441,400	528,608	42,216	43,036	40,012	37,425
United Kingdom	48,504	122,675	12,346	13,058	9,862	9,645
Net Imports						
Australia	8,430	15,886	975	673	64	67
Austria	3,043	3,324	160	337	274	423
Belgium	7,958	9,445	678	1,431	1,254	‡
Canada	30,447	35,453	3,776	2,303	2,593	2,579
Czechoslovakia	3,138	4,650	263	255	346	‡
Denmark	566	799	43	105	21	129
Finland	768	976	75	57	96	56
France	36,498	59,342	4,354	4,962	5,276	‡
Germany	37,855	49,078	4,289	4,488	4,379	3,794
Italy	12,433	17,169	1,043	2,060	1,279	‡
Japan	25,621	34,284	2,663	2,769	2,699	2,677
Netherlands	2,243	3,022	358	158	230	343
Norway	728	813	72	91	57	58
Russia	15,134	12,626	168	949	1,689	*1,000
Spain	.....	2,400	*200	*200	*200	*200
Sweden	2,356	3,857	132	207	100	263
Switzerland	566	653	85	27	67	85
Others estimated†	8,000	.....	.....	.....	.....	.....
Grand totals	685,688	905,060	73,896	77,166	70,498	.....
Minus United States	441,400	528,608	42,216	43,036	40,012	37,425
Total foreign	244,288	376,452	31,680	34,130	30,486	.....

*Estimate to complete table. †Includes Argentina, Brazil, Chile, China, Cuba, Egypt, Estonia, Hungary, Latvia, Mexico, Poland, Portugal, Spain, and Union of South Africa. ‡Not available.

Compiled by Rubber Division, Department of Commerce, Washington, D. C.

Reported Rubber Stocks

Long Tons

Producing Centers	1930 Jan.	Feb.	Mar.	Apr.	May	June
Singapore	28,475	32,074	32,629	34,005	33,302	31,486
Penang	4,993	5,476	5,500	5,575	5,272	4,467
Para	3,447	3,545	3,596	3,596	3,349	2,347
Totals	36,915	41,095	41,725	43,176	41,923	38,300
Manufacturing Centers						
London	60,434	64,557	68,923	74,676	77,312	80,260
Liverpool	19,849	20,605	21,098	23,849	25,415	27,332
Amsterdam	2,134	2,159	2,220	2,204	2,308	.....
United States	120,649	131,748	141,843	148,272	146,179	151,485
Plantations afloat*	94,828	97,931	96,297	85,875	85,835	.....
Totals	297,894	317,000	330,381	334,876	337,049	.....
Grand totals	334,809	358,095	372,106	378,052	378,972	.....

* W. H. Rickinson & Son, *The World's Rubber Position.*
Compiled by Rubber Division, Department of Commerce, Washington, D. C.

London Stocks, June, 1930

London	Landed for June Tons	Delivered for June Tons	Stocks June 30 1930 Tons	1929 Tons	1928 Tons
Plantation	7,490	4,552	80,144	30,875	38,638
Other grades	3	1	54	76	84
Liverpool					
Plantation	†3,024	†1,107	†27,332	†4,550	†2,335
Total tons, London and Liverpool	10,517	5,660	107,530	35,501	41,057

† Official returns from the recognized public warehouses.

United States Statistics

IMPORTS OF CRUDE AND MANUFACTURED RUBBER

	May, 1930		Five Months Ended May, 1930	
	Pounds	Value	Pounds	Value
UNMANUFACTURED—*Free*				
Crude rubber	94,629,646	$13,373,232	499,131,534	$75,401,434
Liquid latex	1,676,834	242,385	4,415,762	797,022
Jelutong or Pontianak	1,348,598	144,415	5,399,649	610,819
Balata	38,333	13,645	385,244	154,559
Gutta percha	.....	.....	11,932	3,182
Guayule	386,036	57,760	1,392,627	209,300
Siak, scrap and reclaimed	1,295,809	17,194	5,025,817	74,884
Totals	99,375,256	$13,848,631	515,762,565	$77,251,200
Chicle *Dutiable*	1,738,197	$848,818	8,018,909	$4,089,473
MANUFACTURED—*Dutiable*				
Belting	2,881	1,841	6,355	3,666
Tires *number*	1,871	18,310	3,455	57,149
Other rubber manufactures	.....	95,404	.....	627,682
Totals	.....	$115,555	.....	$688,497

EXPORTS OF FOREIGN MERCHANDISE

RUBBER AND MANUFACTURES				
Crude rubber	7,064,850	$1,085,432	32,373,717	$5,208,877
Balata	19,531	4,506	1,064,003	226,207
Gutta percha, rubber substitutes, and scrap	.....	.....	24,224	869
Rubber manufactures	.....	53,393	.....	117,354
Totals	.....	$1,143,331	.....	$5,553,307

EXPORTS OF DOMESTIC MERCHANDISE

MANUFACTURED				
Reclaimed	2,103,602	$123,717	10,941,854	$671,589
Scrap and old	4,998,448	173,121	24,111,101	939,630
Rubberized automobile cloth *sq. yd.*	126,423	59,237	575,191	296,402
Other rubberized piece goods and hospital sheeting *sq. yd.*	217,818	62,854	749,187	286,065
Footwear				
Boots *pairs*	64,344	139,260	308,031	685,214
Shoes *pairs*	63,250	44,788	532,547	506,669
Canvas shoes with rubber soles *pairs*	390,177	260,182	2,210,646	1,497,736
Soles *doz. pairs*	11,166	25,920	57,578	160,352
Heels *doz. pairs*	140,275	69,447	559,602	364,659
Water bottles and fountain syringes *number*	37,070	20,501	157,593	83,877
Gloves *doz. pairs*	11,337	30,014	52,857	137,565
Other druggists' sundries	.....	29,097	.....	135,675
Balloons *gross*	71,548	68,765	319,764	324,838
Toys and balls	.....	14,977	.....	51,756
Bathing caps *doz.*	21,338	39,249	117,858	243,108
Bands	61,241	28,932	290,525	135,653
Erasers	47,058	29,919	235,807	143,407
Hard rubber goods				
Electrical goods	71,225	16,640	501,599	83,432
Other goods	.....	40,255	.....	182,865
Tires				
Truck and bus casings, *number*	37,820	791,702	195,984	4,480,594
Other automobile casings, *number*	221,123	2,056,818	960,314	8,453,396
Tubes, auto *number*	171,376	265,202	721,254	1,238,144
Other casings and tubes, *number*	8,391	25,360	36,839	117,081
Solid tires for automobiles and motor trucks *number*	2,608	64,038	13,647	418,949
Other solid tires	133,729	21,694	655,467	116,403
Tire accessories	.....	110,303	.....	561,830
Rubber and friction tape	144,081	40,899	656,555	181,307
Belting	416,004	217,228	2,128,458	1,086,264
Hose	919,991	304,846	3,810,427	1,299,218
Packing	164,432	70,379	885,284	410,330
Thread	147,107	146,480	779,693	759,431
Other rubber manufactures	.....	271,535	.....	1,226,716
Totals	.....	$5,663,359	.....	$27,280,155

Crude Rubber Imports by Customs Districts

	*June, 1930		Six Months Ended *June, 1930	
	Pounds	Value	Pounds	Value
Maine and New Hampshire	56,000	$7,964	56,000	$7,964
Massachusetts	3,066,709	412,408	20,572,699	3,315,856
New York	78,431,111	10,743,121	500,544,802	75,050,804
Philadelphia	33,686	4,267	5,680,409	820,030
Maryland	11,130	1,280	3,108,450	406,787
Mobile	111,080	13,316	111,080	13,316
Virginia	.....	.....	865,361	109,275
Georgia	676,497	85,295	3,800,136	481,771
Los Angeles	7,107,247	944,734	42,427,430	5,956,788
San Francisco	223,445	33,283	982,363	153,456
Oregon	11,212	1,758	78,500	13,057
Indiana	.....	.....	324,740	40,599
Wisconsin	.....	.....	266,180	44,792
Dakota	.....	.....	42,590	6,288
Ohio	167,322	22,178	13,002,658	1,804,731
Colorado	560,000	75,612	2,139,337	318,158
Totals	90,455,439	$12,345,216	594,002,735	$88,543,672

*Including latex, dry rubber content.

United Kingdom Statistics

IMPORTS

UNMANUFACTURED Crude Rubber From—	June, 1930 Pounds	June, 1930 Value	Six Months Ended June, 1930 Pounds	Six Months Ended June, 1930 Value
Straits Settlements	12,630,500	£364,905	95,825,900	£3,038,068
Federated Malay States	6,504,800	199,073	40,693,900	1,299,105
British India	1,080,100	29,856	8,514,900	269,868
Ceylon and Dependencies	2,822,300	76,692	17,716,300	556,039
Java and Dutch Borneo	3,095,300	86,485	17,112,100	545,920
Sumatra and other Dutch possessions in Indian Seas	2,536,900	77,681	12,087,500	393,967
Other countries in East Indies and Pacific not elsewhere specified	146,900	4,234	1,744,800	56,827
Brazil	98,600	2,239	2,907,400	94,838
South and Central America (except Brazil)	.....	.....	122,200	3,719
West Africa				
French West and Equatorial Africa	.....	.....	146,800	4,769
Gold Coast	38,300	1,085	224,400	6,912
Other parts of West Africa	106,700	3,025	933,000	31,121
East Africa, including Madagascar	30,900	862	391,700	12,379
Other countries	205,500	6,264	1,406,900	47,790
Totals	29,296,800	£852,401	199,827,800	£6,361,322
Gutta percha and balata	308,600	£21,043	2,592,000	£196,688
Waste and reclaimed rubber	629,800	7,144	4,694,300	58,524
Rubber substitutes	9,900	239	91,400	1,858
Totals	30,245,100	£880,827	207,205,500	£6,618,392
MANUFACTURED				
*Tires and tubes				
Pneumatic				
Outer covers	.....	£30,817	.....	£168,935
Inner tubes	.....	4,831	.....	38,867
Solid tires	.....	3,878	.....	23,604
Boots and shoes *doz. pairs*	99,678	103,945	869,190	914,053
Other rubber manufactures	.....	167,044	.....	1,263,275
Totals	.....	£310,515	.....	£2,408,734

EXPORTS

UNMANUFACTURED				
Waste and reclaimed rubber	1,704,200	£14,394	12,011,700	£95,778
Rubber substitutes	46,200	972	270,100	5,798
Totals	1,750,400	£15,366	12,281,800	£101,576
MANUFACTURED				
Tires and tubes				
Pneumatic				
Outer covers	.....	£302,705	.....	£2,148,979
Inner tubes	.....	44,685	.....	306,488
Solid tires	.....	6,515	.....	45,676
Boots and shoes *doz. pairs*	21,972	28,721	139,454	188,235
Other rubber manufactures	.....	196,927	.....	1,312,230
Totals	.....	£579,553	.....	£4,001,608

EXPORTS—COLONIAL AND FOREIGN

UNMANUFACTURED				
Crude rubber				
To—				
Russia	25,600	£963	8,050,200	£305,052
Sweden, Norway, and Denmark	149,600	7,025	951,100	41,204
Germany	2,769,000	89,128	15,535,200	513,779
Belgium	641,500	21,775	4,089,200	146,398
France	2,215,300	72,178	12,598,800	465,286
Spain	85,400	4,011	401,100	18,147
Italy	680,600	19,514	2,462,600	83,246
Other countries in Europe	350,500	14,222	2,037,700	88,584
United States	673,300	18,059	2,995,000	89,125
Other countries	102,000	3,819	763,000	35,470
Totals	7,692,800	£250,694	49,883,900	£1,786,291
Gutta percha and balata	45,900	£4,817	348,400	£30,087
Waste and reclaimed rubber	13,300	286	42,000	888
Rubber substitutes	.....	.....	1,500	30
Totals	7,752,000	£255,797	50,275,800	£1,817,296
MANUFACTURED				
Tires and tubes				
Pneumatic				
Outer covers	.....	£4,715	.....	£28,703
Inner tubes	.....	604	.....	3,896
Solid tires	.....	8	.....	93
Boots and shoes *pairs*	2,668	4,265	13,627	23,784
Other rubber manufactures	.....	5,148	.....	38,548
Totals	.....	£14,740	.....	£95,024

* Motor cars, motorcycles, parts, and accessories, liable to duty from Sept. 29, 1915, until Aug. 1, 1924, inclusive, and after July 1, 1925. Commercial vehicles, parts, and accessories were exempt from duty until Apr. 30, 1926, inclusive, and rubber tires and tubes until Apr. 11, 1927, inclusive.

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CALENDER AND MILL ROOM GENERAL FOREMAN, WITH thorough practical experience in all lines of mechanical rubber goods and tire stocks, efficient manager with executive ability, employed at present, desires new connection with progressive company. Best of references. Address Box No. 9898, care of INDIA RUBBER WORLD.

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Would like to make connection with small mechanical rubber company where a thorough knowledge of the business is desired. Familiar with every detail. Prefer one specializing in roll covering and specialties. Can introduce exceptionally profitable lines. Address Box No. 9900, care of INDIA RUBBER WORLD.

POSITION WANTED AS SUPERVISOR OR IN RUBBER DEPARTment. Thoroughly experienced in the manufacture of auto top materials, leatherette, pure gum sheetings, rubberizing, hospital sheetings, calendered clothing, friction tape, splicing compound, gem duck, and pontan for shoe trade, velutex for belts, etc. Holding similar position. Open September 2. Address Box No. 9901, care of INDIA RUBBER WORLD.

RUBBER TECHNOLOGIST, FIVE YEARS' EXPERIENCE IN development and manufacture of rubber footwear, rubber tile flooring, hot water bottles, automobile tires, and inner tubes, desires new connection. Up-to-date knowledge of modern compounding, pressure cures, molding, and all phases of manufacturing. Address Box No. 9902, care of INDIA RUBBER WORLD.

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CHIEF CHEMIST: THE ADVERTISER HAS BEEN SUCCESSFUL in creating and maintaining profits in the manufacture of druggists' sundries, molded goods, and hard rubber, by means of effective technical control over manufacturing processes and the application of the knowledge gained through twelve years of practical experience. A capable executive with creative ability, a good knowledge of modern compounding and factory processes, who keeps in mind that his employer in the final analysis is most interested in results and profits. Address Box No. 9904, care of INDIA RUBBER WORLD.

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Representative wanted to handle soft and hard rubber molded goods as a side line. Address Box No. 9884, care of INDIA RUBBER WORLD.

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(*Advertisements continued on page* 120)

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Nos. ½, 1, 2, 3 and 4 Royle Perfected
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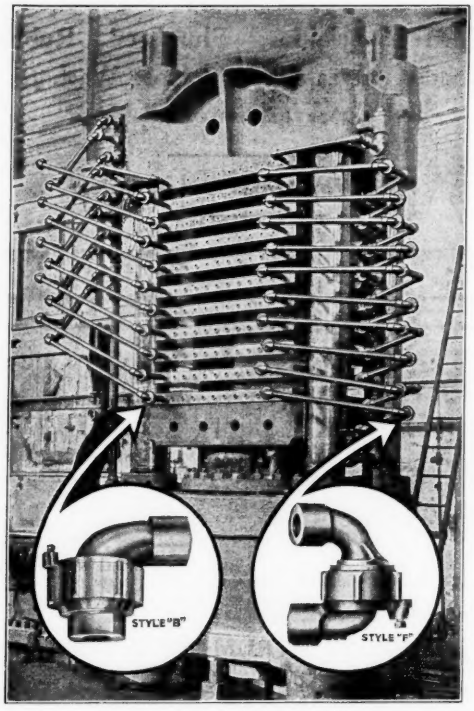

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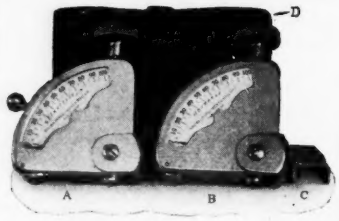

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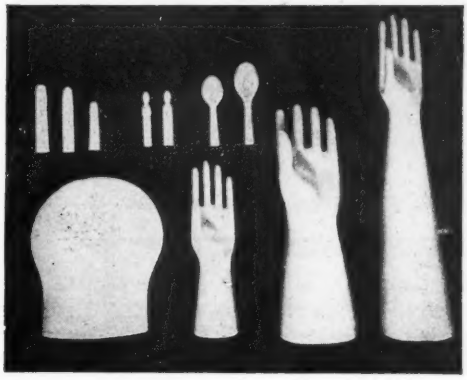

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Biggs Boiler Works Co., The, Akron, O.
Thropp, William R., Son's Co., Trenton, N. J.

BOOTS AND SHOES.

Gutta Percha & Rubber, Limited, Toronto, Canada.
United States Rubber Co., New York.

BRAIDERS—Hose.

New England Butt Co., Providence, R. I.

BRAKE LINING—Asbestos.

Manhattan Rubber Mfg. Division, The, of Raybestos-Manhattan, Inc., Passaic, N. J.
Thermoid Rubber Co., Trenton, N. J.
Woven Steel Hose & Rubber Co., Trenton, N. J.

BRUSHING MACHINES AND BRUSHES.

Curtis & Marble Machine Co., Worcester, Mass.

BUFFING MACHINES.

Emerson Apparatus Co., Melrose, Mass.
National-Erie Co., Erie, Pa.
Utility Manufacturing Co., Cudahy, Wis.

For Complete Addresses See Advertisements—Index Page 144

COTTON FLOCKS

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Our best customers are the leaders in the rubber industry.

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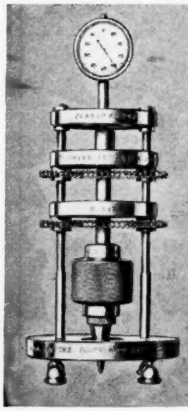

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CHICAGO OFFICE
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Engineers and Machinists
MEDFORD, MASS.

BUYERS' GUIDE

BULBS.
Davol Rubber Co., Providence, R. I.
Seamless Rubber Co., The, New Haven, Conn.
United States Rubber Co., New York.
Whitall Tatum Co., New York.

CADMIUM YELLOW.
Hammill & Gillespie, Inc., New York, N. Y.
Harshaw Chemical Co., The, Cleveland, Ohio.
Waldo, E. M. & F., Inc., Muirkirk, Md.
Wishnick-Tumpeer, Inc., New York

CALENDER SHELLS.
Gammeter, W. F., Co., The, Cadiz, Ohio.
Lowe, Clyde E., Co., The, Cleveland, Ohio.
National Sherardizing & Machine Co., The, Hartford, Conn.

CALENDER SCREW-DOWN — Motor Driven.
Farrel-Birmingham Co., Inc., Ansonia, Conn.
Farrel - Birmingham Co., Inc., Derby, Conn.

CALENDERED GOODS.
Archer Rubber Co., Milford, Mass.
Canfield Rubber Co., Bridgeport, Conn.
Meade Rubber Co., Stoughton, Mass.
Plymouth Rubber Co., Inc., Canton, Mass.
Rand Rubber Co., Inc., Brooklyn, N. Y.
United States Rubber Co., New York.

CALENDERS.
Adamson Machine Co., The, Akron, Ohio.
Farrel-Birmingham Co., Inc., Ansonia, Conn.
Farrel - Birmingham Co., Inc., Derby, Conn.
Nagle Machine Co., Erie, Pa.
National-Erie Co., Erie, Pa.
Thropp, William R., Son's Co., Trenton, N. J.

CALENDERS—Brake Lining.
Black Rock Mfg. Co., The, Bridgeport, Conn.

CALENDERS—Embossing.
Farrel - Birmingham Co., Inc., Ansonia, Conn.
Farrel - Birmingham Co., Inc., Derby, Conn.
Textile-Finishing Machinery Co., Providence, R. I.

CALENDERS—Packing.
Black Rock Mfg. Co., The, Bridgeport, Conn.

CARBON BLACK.
Binney & Smith Co., New York.
Cabot, Godfrey L., Inc., Boston, Mass.
Hall, C. P., Co., The, Akron, Ohio.
Harshaw Chemical Co., The, Cleveland, Ohio.
Huber, J. M., Inc., New York.
United Carbon Co., Charleston, W. Va.
Whittaker, Clark & Daniels, Inc., New York.
Wishnick-Tumpeer, Inc., New York.

CARBON, TETRACHLORIDE AND BISULPHIDE.
Hall, C. P., Co., The, Akron, Ohio.
Harshaw Chemical Co., The, Cleveland, Ohio.
Wishnick-Tumpeer, Inc., New York.

CASTINGS.
Adamson Machine Co., The, Akron, Ohio.
Farrel-Birmingham Co., Inc., Ansonia, Conn.
Farrel-Birmingham Co., Inc., Derby, Conn.
Farrel - Birmingham Co., Inc., Buffalo, N. Y.
Nagle Machine Co., Erie, Pa.
National-Erie Co., Erie, Pa.

CAUSTIC SODA.
Harshaw Chemical Co., The, Cleveland, Ohio.
Wishnick-Tumpeer, Inc., New York.

CEMENT CHURNS.
American Tool & Machine Co., Boston, Mass.

CEMENT—Rubber.
Essex Rubber Co., Trenton, N. J.
St. Louis Rubber Cement Co., Inc., St. Louis, Mo.
Tingley-Reliance Rubber Corp., Rahway, N. J.
United States Rubber Co., New York.

CHEMISTS—Consulting Rubber.
Maywald, F. J., Carlstadt, N. J.
Olin, R. R., Laboratories, Akron, Ohio.

CHICLE—Synthetic.
Sweets Laboratories, New York, N. Y.

CHINA CLAY.
Hammill & Gillespie, Inc., New York, N. Y.
Harshaw Chemical Co., The, Cleveland, Ohio.
Huber, J. M., Inc., New York.
Taintor Co., The, Bayonne, N. J.
Vanderbilt, R. T., Co., Inc., New York.
Whittaker, Clark & Daniels, Inc., New York.
Wishnick-Tumpeer, Inc., New York.

CHROMIUM—Oxide.
Hammill & Gillespie, Inc., New York, N. Y.
Harshaw Chemical Co., The, Cleveland, Ohio.
McNulty, Joseph A., New York, N. Y.
Waldo, E. M. & F., Inc., New York.
Williams, C. K., & Co., Easton, Pa.
Wishnick-Tumpeer, Inc., New York.

CHROMIUM PLATING
National Sherardizing & Machine Co., The, Hartford, Conn.

CHUCKS—Automatic Core.
Bridgwater Machine Co., The, Akron, Ohio.
India Machine & Rubber Mold Co., The, Akron, Ohio.
National Rubber Machinery Co., Akron, Ohio.

CLEANERS—Crude Rubber.
National-Erie Co., Erie, Pa.

CLICKING MACHINES.
United Shoe Machinery Corp., Boston, Mass.

CLOTHING—Waterproof.
Archer Rubber Co., Milford, Mass.
Badger Raincoat Co., Port Washington, Wis.
Chicago Rubber Clothing Co., Racine, Wisconsin.
Pirelli, Milan, Italy.
United States Rubber Co., New York.

CLUTCH BRAKES—Pneumatic.
Farrel - Birmingham Co., Inc., Derby, Conn.

CLUTCHES—Friction.
American Tool & Machine Co., Boston, Mass.
Farrel - Birmingham Co., Inc., Ansonia, Conn.
Farrel - Birmingham Co., Inc., Derby, Conn.
National-Erie Co., Erie, Pa.

CLUTCHES AND BRAKES—Magnetic.
Farrel - Birmingham Co., Inc., Ansonia, Conn.
Farrel - Birmingham Co., Inc., Derby, Conn.

COLORS.
Binney & Smith Co., New York.
Du Pont, E. I., De Nemours & Co., Inc., Wilmington, Del.
Hammill & Gillespie, Inc., New York, N. Y.
Harshaw Chemical Co., The, Cleveland, Ohio.
Huber, J. M., Inc., New York.
McNulty, Joseph A., New York.
Rubber Service Laboratories Co., The, Akron, Ohio.
Tyson Bros., Inc., Woodbridge, N. J.
Waldo, E. M. & F., Inc., Muirkirk, Md.
Whittaker, Clark & Daniels, Inc., New York.
Williams, C. K., & Co., Easton, Pa.
Wishnick-Tumpeer, Inc., New York.

COLORS—Balloon.
Du Pont, E. I., De Nemours & Co., Inc., Wilmington, Del.
National Aniline & Chemical Co., New York, N. Y.

COMBS.
Seamless Rubber Co., The, New Haven, Conn.
United States Rubber Co., New York.

COMPRESSORS—Air.
National-Erie Co., Erie, Pa.

CONNECTORS—Air.
Akron Standard Mold Co., Akron, Ohio.

CONTROLLERS—Temperature.
Bristol Co., The, Waterbury, Conn.

CORD—Pure Rubber.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Canfield Rubber Co., Bridgeport, Conn.
Davol Rubber Co., Providence, R. I.
Gutta Percha & Rubber, Ltd., Toronto, Canada.
Manhattan Rubber Mfg. Division, The, of Raybestos-Manhattan, Inc., Passaic, N. J.
New York Belting & Packing Co., New York.
United States Rubber Co., New York.

COTTON GOODS.
See Ducks and Drills
Hollands
Osnaburgs
Sheetings
Tire Fabrics

COUPLINGS—Flexible and Rigid.
Farrel - Birmingham Co., Inc., Ansonia, Conn.
Farrel - Birmingham Co., Inc., Derby, Conn.

CRACKERS.
Adamson Machine Co., The, Akron, Ohio.
Erie Foundry Co., Erie, Pa.
Farrel - Birmingham Co., Inc., Ansonia, Conn.
Farrel - Birmingham Co., Inc., Derby, Conn.
Nagle Machine Co., Erie, Pa.
National-Erie Co., Erie, Pa.

CRANES.
Southwark Foundry & Machine Co., Philadelphia, Pa.

CRANES—Hydraulic.
Watson-Stillman Co., The, New York.

CUTTERS—Band.
Adamson Machine Co., The, Akron, Ohio.
Black Rock Mfg. Co., The, Bridgeport, Conn.
Utility Manufacturing Co., Oudaby, Wis.

CUTTERS—Bias.
Farrel - Birmingham Co., Inc., Derby, Conn.
National Rubber Machinery Co., Akron, Ohio.
Spadone Machine Co., Inc., New York.

CUTTERS—Crude Rubber.
Black Rock Mfg. Co., The, Bridgeport, Conn.
Farrel - Birmingham Co., Inc., Ansonia, Conn.
Peerless Machine Co., The, Racine, Wis.
Southwark Foundry & Machine Co., Philadelphia, Pa.

CUTTERS—Jar Rings, Washers, etc.
Black Rock Manufacturing Co., The, Bridgeport, Conn.

CUTTERS—Scrap Rubber.
Taylor, Stiles & Co., Riegelsville, N. J.

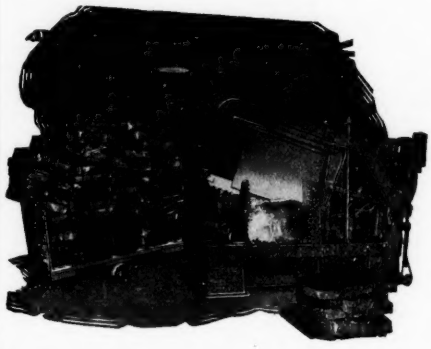
CUTTERS—Sole.
Wellman Co., Medford, Mass.

CUTTERS—Stock.
Black Rock Mfg. Co., The, Bridgeport, Conn.
Housatonic Machine & Tool Co., Bridgeport, Conn.

CUTTERS—Strip.
Cameron Machine Co., Brooklyn, N. Y.
Farrel - Birmingham Co., Inc., Derby, Conn.
New England Butt Co., Providence, R. I.

CUTTERS—Tape.
Black Rock Mfg. Co., The, Bridgeport, Conn.

For Complete Addresses See Advertisements—Index Page 144



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BUYERS' GUIDE

CUTTERS—Tire.
Adamson Machine Co., The, Akron, Ohio.
National-Erie Co., Erie, Pa.
Peerless Machine Co., The, Racine, Wis.

CUTTERS—Tread.
Black Rock Mfg. Co., The, Bridgeport, Conn.
National-Erie Co., Erie, Pa.
Utility Manufacturing Co., Cudahy, Wis.

DENSIMETERS.
Stowe & Woodward Co., Newton Upper Falls, Mass.

DENTAL GUM.
Rand Rubber Co., Inc., Brooklyn, N. Y.
United States Rubber Co., New York.

DENTAL RUBBER DAM.
Davol Rubber Co., Providence, R. I.
Rand Rubber Co., Inc., Brooklyn, N. Y.
United States Rubber Co., New York.

DEVULCANIZERS.
Biggs Boiler Works Co., The, Akron, Ohio.

DIE SINKING AND ENGRAVING.
Fort Hill Engraving Co., Boston, Mass.
Hoggson & Pettis Mfg. Co., The, New Haven, Conn.
Mechanical Mold & Machine Co., The, Akron, Ohio.

DIES.
Akron Equipment Co., The, Akron, Ohio.
Fort Hill Engraving Co., Boston, Mass.
Fremont Tool & Die Co., Fremont, Ohio.
Hoggson & Pettis Mfg. Co., New Haven, Conn.
Housatonic Machine & Tool Co., Bridgeport, Conn.
Mechanical Mold & Machine Co., The, Akron, Ohio.
National-Erie Co., Erie, Pa.

DIES—Cutting.
Fort Hill Engraving Co., Boston, Mass.
Fremont Tool & Die Co., Fremont, Ohio.
Hoggson & Pettis Mfg. Co., The, New Haven, Conn.

DIES—Embossing.
Fort Hill Engraving Co., Boston, Mass.

DIES—Marking.
Fort Hill Engraving Co., Boston, Mass.
Hoggson & Pettis Mfg. Co., The, New Haven, Conn.

DIPPED GOODS.
Seamless Rubber Co., The, New Haven, Conn.

DIPPED GOODS FORMS.
Colonial Insulator Co., The, Akron, Ohio.
Seville Porcelain Co., Seville, O.

DOLLS.
Seamless Rubber Co., The, New Haven, Conn.
United States Rubber Co., New York.

DOUBLING MACHINES.
American Tool & Machine Co., Boston, Mass.
Farrel - Birmingham Co., Inc., Ansonia, Conn.
Farrel - Birmingham Co., Inc., Derby, Conn.
Utility Manufacturing Co., Cudahy, Wis.

DRESS SHIELD MATERIAL.
Aldan Rubber Co., Philadelphia, Pa.
Archer Rubber Co., Milford, Mass.
Canfield Rubber Co., The, Bridgeport, Conn.
Ohio Manufacturing Co., Middletown, Conn.
Plymouth Rubber Co., Inc., Canton, Mass.
Rand Rubber Co., Inc., Brooklyn, N. Y.
United States Rubber Co., New York.

DRIERS—Cloth.
Farrel - Birmingham Co., Inc., Ansonia, Conn.
Farrel - Birmingham Co., Inc., Derby, Conn.
Textile-Finishing Machinery Co., Providence, R. I.

DRUMS—Tire Building.
Bridgwater Machine Co., The, Akron, Ohio.
National Rubber Machinery Co., Akron, Ohio.
Utility Manufacturing Co., Cudahy, Wisconsin.

DRYING MACHINES.
American Process Co., New York.
Carrier Engineering Corp., Newark, N. J.
Farrel - Birmingham Co., Inc., Ansonia, Conn.
Farrel - Birmingham Co., Inc., Derby, Conn.
Textile-Finishing Machinery Co., Providence, R. I.

DUCKS AND DRILLS.
Adams, H. J., Co., The, Akron, Ohio.
Callaway Mills, Inc., New York.
Curran & Barry, New York.
Lane, J. H., & Co., New York and Chicago.

DUROMETERS.
Shore Instrument & Mfg. Co., The, Jamaica, N. Y.

ENGINEERING DEVICES.
Yarnall-Waring Co., Philadelphia, Pa.

EXPERIMENTAL WORK.
Maywald, F. J., Carlstadt, N. J.
Rhoades, R. W., Metaline Co., Inc., Long Island City, N. Y.

EYELETTING MACHINES.
United Shoe Machinery Corporation, Boston, Mass.

FABRIC COATING MACHINES.
American Tool & Machine Co., Boston, Mass.

FACTICE.
See Rubber Substitutes.

FINGER COTS.
Davol Rubber Co., Providence, R. I.
Seamless Rubber Co., The, New Haven, Conn.
United States Rubber Co., New York.
Whitall Tatum Co., New York.
Wilson Rubber Co., Canton, Ohio.

FIXTURES — Hot Water Bottle, Combination.
Davidson Rubber Co., Boston, Mass.

FLOCK—COTTON.
Claremont Waste Mfg. Co., Claremont, N. H.

FLOORING.
Manhattan Rubber Mfg. Division, The, of Raybestos-Manhattan, Inc., Passaic, N. J.
Plymouth Rubber Co., Inc., Canton, Mass.
United States Rubber Co., New York.

FOSSIL FLOUR.
Hammill & Gillespie, Inc., New York, N. Y.
Harshaw Chemical Co., The, Cleveland, Ohio.
Whittaker, Clark & Daniels, Inc., New York.

GAGES—Hardness.
Pusey & Jones Corporation, The, Wilmington, Del.
Shore Instrument & Mfg. Co., The, Jamaica, N. Y.
Stowe & Woodward Co., Newton Upper Falls, Mass.

GAGES—Magnetic.
Magnetic Gauge Co., The, Akron, Ohio.

GAGES—Pressure.
Bristol Co., The, Waterbury, Conn.
Hoggson & Pettis Mfg. Co., New Haven, Conn.
Utility Manufacturing Co., Cudahy, Wis.

GAGES—Thickness.
Hoggson & Pettis Mfg. Co., New Haven, Conn.
Randall, Frank E., Waltham, Mass.

GAGES—Tire Pressure.
Schrader's, A., Son, Inc., Brooklyn, N. Y.

GASKETS.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Canfield, H. O., Co., Bridgeport, Conn.
Elkhart Rubber Works, Elkhart, Ind.
Essex Rubber Co., Trenton, N. J.
Garlock Packing Co., The, Palmyra, N. Y.
Gutta Percha & Rubber, Ltd., Toronto, Canada.
Home Rubber Co., Trenton, N. J.
Linear Packing & Rubber Co., Inc., Philadelphia, Pa.
Manhattan Rubber Mfg. Division, The, of Raybestos-Manhattan, Inc., Passaic, N. J.
New York Belting & Packing Co., New York.
Thermoid Rubber Co., Trenton, N. J.
United States Rubber Co., New York.
Western Rubber Co., Goshen, Ind.
Yarnall-Waring Co., Philadelphia, Pa.

GASTEX.
General Atlas Carbon Co., New York, N. Y.

GEAR CUTTING.
Farrel - Birmingham Co., Inc., Ansonia, Conn.
Farrel - Birmingham Co., Inc., Derby, Conn.
National-Erie Co., Erie, Pa.

GEARS.
Farrel - Birmingham Co., Inc., Ansonia, Conn.
Farrel - Birmingham Co., Inc., Derby, Conn.
Farrel - Birmingham Co., Inc., Buffalo, N. Y.
National-Erie Co., Erie, Pa.

GEARS—Helical.
Farrel - Birmingham Co., Inc., Ansonia, Conn.
Farrel - Birmingham Co., Inc., Derby, Conn.
Farrel - Birmingham Co., Inc., Buffalo, N. Y.
National-Erie Co., Erie, Pa.

GEARS—Herringbone.
Farrel - Birmingham Co., Inc., Ansonia, Conn.
Farrel - Birmingham Co., Inc., Derby, Conn.
Farrel - Birmingham Co., Inc., Buffalo, N. Y.
National-Erie Co., Erie, Pa.

GEARS—Reduction.
Farrel - Birmingham Co., Inc., Ansonia, Conn.
Farrel - Birmingham Co., Inc., Derby, Conn.
National-Erie Co., Erie, Pa.
Utility Manufacturing Co., Cudahy, Wis.

GEARS—Worm.
Utility Manufacturing Co., Cudahy, Wis.

GEM DUCK.
Plymouth Rubber Co., Inc., Canton, Mass.

GLOVES—Electricians', Household and Surgeons'.
Davol Rubber Co., Providence, R. I.
Seamless Rubber Co., The, New Haven, Conn.
United States Rubber Co., New York.
Wilson Rubber Co., Canton, Ohio.

GRAPHITE.
Whittaker, Clark & Daniels, Inc., New York.

GRINDERS—Hard Rubber Dust.
Day, J. H., Co., The, Cincinnati, Ohio.
Farrel - Birmingham Co., Inc., Derby, Conn.

GUAYULE RUBBER.
Continental Rubber Co., New York.
Wilson, Charles T., Co., Inc., New York.

GUTTA PERCHA.
Hankin, Geo., & Co., London, England. (Weeks, Handy & Co., Inc., New York).
Jacoby, Ernest, Boston, Mass.

HARD RUBBER DUST.
Muehlstein, H., & Co., Inc., New York.
Somerset Rubber Reclaiming Works, New Brunswick, N. J.
Weber, Hermann, Hoboken, N. J.

HARD RUBBER GOODS.
Davol Rubber Co., Providence, R. I.
Seamless Rubber Co., The, New Haven, Conn.
Stokes, Joseph, Rubber Co., Trenton, N. J.
United States Rubber Co., New York.

For Complete Addresses See Advertisements—Index Page 144

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Aero Brand Rubber Sulphur is carefully ground to definite specifications, air floated and bolted through silk. Shipped promptly from large stocks. You will be entirely satisfied with it.

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In Italy—Spain—England and Argentine

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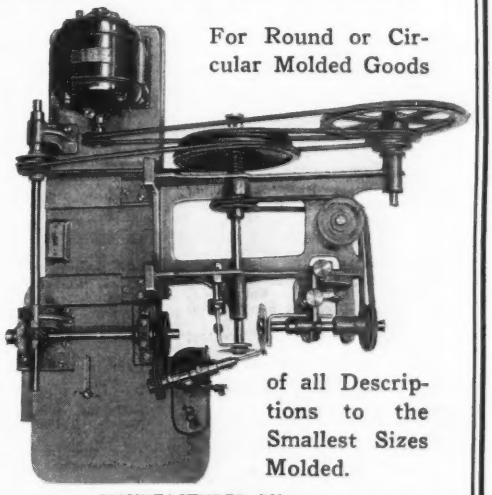
100% INCREASED PRODUCTION
THE MORRIS
MECHANICAL GOODS TRIMMER

VERTICAL VIEW



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BUYERS' GUIDE

HARD RUBBER GOODS.—Druggists' and Stationers' Sundries.
Davol Rubber Co. Providence, R. I.
Pirelli, Milan, Italy.
Seamless Rubber Co., The, New Haven, Conn.
Stokes, Joseph, Rubber Co., Trenton, N. J.
United States Rubber Co., New York.
Whitall Tatum Co., New York, N. Y.

HARD RUBBER GOODS—Electrical.
Stokes, Joseph, Rubber Co., Trenton, N. J.
United States Rubber Co., New York.

HAT BAGS.
New York Belting & Packing Co., New York.

HEEL NAILS.
United Shoe Machinery Corporation, Boston, Mass.

HEELS.
Plymouth Rubber Co., Inc., Canton, Mass.
United States Rubber Co., New York.

HEELS AND SOLES.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Canfield Rubber Co., Bridgeport, Conn.
Essex Rubber Co., Trenton, N. J.
Gutta Percha and Rubber, Ltd., Toronto, Canada.
Manhattan Rubber Mfg. Division, The, of Raybestos-Manhattan, Inc., Passaic, N. J.
Plymouth Rubber Co., Inc., Canton, Mass.
United States Rubber Co., New York.
Western Rubber Co., Goshen, Ind.

HOISTS.
Utility Manufacturing Co., Cudahy, Wis.

HOISTS—Hydraulic.
Utility Manufacturing Co., Cudahy, Wis.
Watson-Stillman Co., The, New York.

HOSE—Armored.
Woven Steel Hose & Rubber Co., Trenton, N. J.

HOSE—Rubber.
Air Brake, Fire, Garden, Pneumatic, Suction, Submarine, Vacuum, Dredging Sleeves, Radiator.
Acme Rubber Mfg. Co., Trenton, N. J.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Gutta Percha & Rubber, Limited, Toronto, Canada.
Home Rubber Co., Trenton, N. J.
Manhattan Rubber Mfg. Division, The, of Raybestos-Manhattan, Inc., Passaic, N. J.
New York Belting & Packing Co., New York.
Thermoid Rubber Co., Trenton, N. J.
United States Rubber Co., New York.
Western Rubber Co., Goshen, Ind.

HOSE—Rubber (Continued)
Woven Steel Hose & Rubber Co., Trenton, N. J.

HOSE—Rubber Lined. Cotton and Linen.
Acme Rubber Mfg. Co., Trenton, N. J.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Gutta Percha and Rubber, Limited, Toronto, Canada.
Home Rubber Co., Trenton, N. J.
Manhattan Rubber Mfg. Division, The, of Raybestos-Manhattan, Inc., Passaic, N. J.
New York Belting & Packing Co., New York.
United States Rubber Co., New York.
Woven Steel Hose & Rubber Co., Trenton, N. J.

HOSE FITTINGS—Brass.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Manhattan Rubber Mfg. Division, The, of Raybestos-Manhattan, Inc., Passaic, N. J.
Western Rubber Co., Goshen, Ind.
Yerdon, William, Fort Plain, New York.

HOSE LININGS.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Gutta Percha and Rubber, Ltd., Toronto, Canada.
Manhattan Rubber Mfg. Division, The, of Raybestos-Manhattan, Inc., Passaic, N. J.
New York Belting & Packing Co., New York.
United States Rubber Co., New York.

HOSE MACHINES.
Farrel - Birmingham Co., Inc., Ansonia, Conn.
Farrel - Birmingham Co., Inc., Derby, Conn.
National-Erie Co., Erie, Pa.
New England Butt Co., Providence, R. I.
Spadone Machine Co., Inc., New York, N. Y.
Terkelsen Machine Co., Boston, Mass.

HOSE WIRING MACHINES.
Adamson Machine Co., The, Akron, Ohio.

HOSPITAL SHEETINGS.
Aldan Rubber Co., Philadelphia, Pa.
Archer Rubber Co., Milford, Mass.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
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Meade Rubber Co., Stoughton, Mass.
Omo Manufacturing Co., Middletown, Conn.
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United States Rubber Co., New York.

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Ohmiac Paint & Refining Co., Chicago, Ill.
Wishnick-Tumpeer, Inc., New York, N. Y.

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Davol Rubber Co., Providence, R. I.
Seamless Rubber Co., The, New Haven, Conn.
United States Rubber Co., New York.
Whitall Tatum Co., New York.

INFUSORIAL EARTH—See Fossil Flour.

INNER TUBES.
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General Tire & Rubber Co., Akron, Ohio.
Gutta Percha & Rubber, Limited, Toronto, Canada.
United States Rubber Co., New York.

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Pirelli, Milan, Italy.
United States Rubber Co., New York.

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Erie Foundry Co., Erie, Pa.
Farrel - Birmingham Co., Inc., Ansonia, Conn.
Housatonic Machine & Tool Co., Bridgeport, Conn.
Nagle Machine Co., Erie, Pa.
National-Erie Co., Erie, Pa.
New England Butt Co., Providence, R. I.
Royle, John, & Sons, Paterson, N. J.

IRON OXIDE—See Red Oxide.

JAR RING CUTTING MACHINES.
Black Rock Mfg. Co., The, Bridgeport, Conn.

JAR RINGS.
Acme Rubber Mfg. Co., Trenton, N. J.
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United States Rubber Co., New York.
Western Rubber Co., Goshen, Ind.

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JOINTS—Pipe.
Diamond Metal Products Co., St. Louis, Mo.
Flexo Supply Co., St. Louis, Mo.
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Barco Manufacturing Co., Chicago, Ill.
Bridgwater Machine Co., The, Akron, Ohio.
Diamond Metal Products Co., St. Louis, Mo.
Flexo Supply Co., St. Louis, Mo.
National Erie Co., Erie, Pa.

KNIVES.
Fremont Tool & Die Co., Fremont, Ohio.

LABORATORY EQUIPMENT.
Biggs Boiler Works Co., The, Akron, Ohio.
Bristol Co., The, Waterbury, Conn.
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Emerson Apparatus Co., Melrose, Mass.
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Farrel-Birmingham Co., Inc., Derby, Conn.
Nagle Machine Co., Erie, Pa.
National Rubber Machinery Co., Akron, Ohio.
Shore Instrument & Mfg. Co., The, Jamaica, N. Y.

LAMPBLACK.
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Harshaw Chemical Co., The, Cleveland, Ohio.
Whittaker, Clark & Daniels, Inc., New York.
Wishnick-Tumpeer, Inc., New York.

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Jacoby, Ernest, Boston, Mass.
United States Rubber Co., New York.

LATHES—Hard Rubber.
Adamson Machine Co., The, Akron, Ohio.

LATHES—Jar Ring.
Adamson Machine Co., The, Akron, Ohio.
Thropp, William R., Son's Co., Trenton, N. J.

LEAD—Oleate.
Harshaw Chemical Co., The, Cleveland, Ohio.
Stamford Rubber Supply Co., Stamford, Conn.
Wishnick-Tumpeer, Inc., New York.

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British Institution of the Rubber Industry

The following papers have been published in the "IRI Transactions" Volume V and Volume VI, No. 1:—

"On the Permeability of Rubber Mixings," W. Cecil Davey, M.Sc., A.I.C., A.I.R.I. (Sc.) and T. Ohya.
"The Ageing of Cotton Contained in Rubber Goods," Dr. Guy Barr.
"Comparison of Acetylene Black with Gas Black and Lamp-Black," T. R. Dawson, M.Sc., F.I.C., F.I.R.I. and N. H. Hartshorne, M.Sc., A.I.C.
"Heats of Combustion of Rubber, Gutta-Percha and Balata," T. H. Messenger, A.R.C.Sc., M.Sc.
"The Swelling of Vulcanized Rubber in Liquids," J. R. Scott, M.Sc., Ph.D., F.I.C.
"Steam Production and Economy in the Rubber Factory," G. B. Williamson, M.I. Mech.E.
"Standardization of Vulcanization Testing," J. R. Scott, Ph.D., F.I.C.
"Some Aspects of Rubber Manufacture in America," Herbert Rogers, F.C.S., F.I.R.I.
"Vulcanization Experiments with Aniline Sulphate," A. Zeitlin, A.I.C., A.I.R.I. (Sc.) and L. H. Williams.
"The Accelerating Influence of a Basic Azo-Dye in Vulcanization," Dr. T. J. Drakeley and A. G. Coulson.
"Some Fundamental Rubber Problems," Professor G. Stafford Whitby.
"Pneumatic Tyre Design as Affected by Modern Motor Transportation," W. E. Shively.
"Rubber as a Substitute for Leather," Dr. P. Schidrowitz.
"Machine Testing of Pneumatic Covers," L. J. Mountford, B.Sc.
"Risks of the Rubber Worker and their Prevention," W. G. Martin, F.I.C., F.I.R.I.
"Application of Electricity to the Rubber Industry," F. Walker, A.M.I. Mech.E.
"Comparison between the effect of Single, Double and Treble Shifts on the Fatigue of the Worker," Dr. H. M. Vernon.
"Anti-oxidants," Dr. W. J. S. Naunton.
"The Manufacture of Reclaimed Rubber," R. F. Pearson.
"The Testing of Reclaimed Rubber," W. E. Stafford.
"A comparison of the Effect of Pigment Reinforcement of Crude and Reclaimed Rubber," J. Stopforth, A.I.R.I. (Sc.), A.I.R.I. (Tech.)
"The Applications and Analysis of Latex," W. H. Stevens, A.R.C.Sc. (Lond.)
"Studies in the Oxidation of Rubber Mixings," W. C. Davey, M.Sc., A.I.C., A.I.R.I. (Sc.)
"Alternating Behaviour of Fatty Acids in Rubber Compounds," T. L. Garner, M.Sc., A.I.R.I. (Sc.)
"Smoke Production for the Rubber Industry," Dr. D. F. Twiss.
"An Investigation of the Viscosity of Rubber Solutions," C. M. Blow, B.Sc.
"The Aging of Rubber Compounded with China Clay," Dr. T. J. Drakeley.
"A Note on the Sun-Cracking of Vulcanised Rubber," B. B. Evans, B.Sc., A.I.C., A.I.R.I. (Sc.)
"Some Fundamental Rubber Problems" (Part II), Prof. G. Stafford Whitby.
"An Instrument for Testing Hardness and Permanent Set of Rubber and for Measuring Thickness of Test Pieces," Dr. H. A. Daynes.
"A Method of Making Electrical Contact with Ebonite and Soft Rubber for Insulation Tests," H. F. Church, B.Sc.
"The Refining of Mineral Black and its Reinforcing and other Properties," Dr. P. Schidrowitz.

The above papers, together with discussions, appear only in the "I.R.I. Transactions," the official journal of the Institution of the Rubber Industry.

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Wishnick-Tumpeer, Inc., New York.

LINERS—Processed.
Cleveland Liner & Mfg. Co., The, Cleveland, Ohio.

LITHARGE.
Hall, C. P., Co., The, Akron, Ohio.
Harshaw Chemical Co., The, Cleveland, Ohio.
Wishnick-Tumpeer, Inc., New York.

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Wishnick-Tumpeer, Inc., New York.

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Farrel - Birmingham Co., Inc., Derby, Conn.
Nagle Machine Co., Erie, Pa.

MAGNESIA—Calcined.
Harshaw Chemical Co., The, Cleveland, Ohio.
Whittaker, Clark & Daniels, Inc., New York.
Wishnick-Tumpeer, Inc., New York.

MAGNESIUM CARBONATE AND OXIDE.
Hammill & Gillespie, Inc., New York, N. Y.
Harshaw Chemical Co., The, Cleveland, Ohio.
Wishnick-Tumpeer, Inc., New York, N. Y.

MANDRELS—Circular.
Lowe, Clyde E., Co., The, Cleveland, Ohio.

MANDRELS—Sherardized.
National Sherardizing & Machine Co., The, Hartford, Conn.

MANDRELS—Tube Splicing.
National-Erie Co., Erie, Pa.

MARKING DEVICES.
Fort Hill Engraving Co., Boston, Mass.

MASTICATORS.
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Farrel - Birmingham Co., Inc., Ansonia, Conn.
Farrel - Birmingham Co., Inc., Derby, Conn.

MATTING—Mats and Stair Treads.
Acme Rubber Mfg. Co., Trenton, N. J.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Essex Rubber Co., Trenton, N. J.
Garlock Packing Co., The, Palmyra, N. Y.
Gutta Percha & Rubber, Limited, Toronto, Canada.
Home Rubber Co., Trenton, N. J.
Manhattan Rubber Mfg. Division, The, of Raybestos-Manhattan, Inc., Passaic, N. J.
New York Belting & Packing Co., New York.
Rhoades, R. W., Metaline Co., Inc., Long Island City, N. Y.
United States Rubber Co., New York.
Western Rubber Co., Goshen, Ind.

MICA.
Hall, C. P., Co., The, Akron, Ohio.
Harshaw Chemical Co., The, Cleveland, Ohio.
Whittaker, Clark & Daniels, Inc., New York.
Wishnick-Tumpeer, Inc., New York.

MILLING.
Tingley-Reliance Rubber Corp., Rahway, N. J.

MILLS.
Adamson Machine Co., The, Akron, Ohio.
Biggs Boiler Works Co., The, Akron, Ohio.
Erie Foundry Co., Erie, Pa.
Farrel - Birmingham Co., Inc., Ansonia, Conn.
Farrel - Birmingham Co., Inc., Derby, Conn.
Nagle Machine Co., Erie, Pa.
National-Erie Co., Erie, Pa.
Thropp, William R., Son's Co., Trenton, N. J.

MINERAL RUBBER.
Barber Asphalt Co., Philadelphia, Pa.
Harshaw Chemical Co., The, Cleveland, Ohio.
Ohmiac Paint & Refining Co., Chicago, Ill.
Robertson, H. H., Co., Pittsburgh, Pa.
Vanderbilt, R. T., Co., Inc., New York.
Whittaker, Clark & Daniels, Inc., New York.

MIXERS—Automatic.
Wishnick-Tumpeer, Inc., New York.
Farrel - Birmingham Co., Inc., Ansonia, Conn.
Farrel - Birmingham Co., Inc., Derby, Conn.

MIXERS—Cement, Plastic.
American Tool & Machine Co., Boston, Mass.
Day, J. H., Co., The, Cincinnati, Ohio.

MIXERS—Internal.
Farrel - Birmingham Co., Inc., Derby, Conn.

MOLDS.
Adamson Machine Co., The, Akron, Ohio.
Akron Equipment Co., The, Akron, Ohio.
Akron Standard Mold Co., Akron, Ohio.
Bridgwater Machine Co., The, Akron, Ohio.
Brockton Tool Co., Brockton, Mass.
Hoggson & Pettis Mfg. Co., New Haven, Conn.
Housatonic Machine & Tool Co., Bridgeport, Conn.
India Machine & Rubber Mold Co., The, Akron, Ohio.
Lake Erie Engineering Corporation, Buffalo, N. Y.
Mechanical Mold & Machine Co., The, Akron, Ohio.
National-Erie Co., Erie, Pa.
National Rubber Machinery Co., Akron, Ohio.
Southwark Foundry & Machine Co., Philadelphia, Pa.

MOLDS—Bead.
Akron Standard Mold Co., Akron, Ohio.
Bridgwater Machine Co., The, Akron, Ohio.
India Machine & Rubber Mold Co., The, Akron, Ohio.
National-Erie Co., Erie, Pa.
National Rubber Machinery Co., Akron, Ohio.
Utility Manufacturing Co., Cudahy, Wisconsin.

MOLDS—Druggists' Sundries.
Hoggson & Pettis Mfg. Co. The, New Haven, Conn.
Mechanical Mold & Machine Co., Akron, Ohio.
Rhoades, R. W., Metaline Co., Inc., Long Island City, N. Y.

MOLDS—Engraving Tire.
Bridgwater Machine Co., The, Akron, Ohio.
National-Erie Co., Erie, Pa.
National Rubber Machinery Co., Akron, Ohio.
Utility Manufacturing Co., Cudahy, Wis.

MOLDS—Heels and Soles.
Brockton Tool Co., Brockton, Mass.
Hoggson & Pettis Mfg. Co., New Haven, Conn.
Mechanical Mold & Machine Co., Akron, Ohio.
Wade, Levi C., Lynn, Mass.

MOLDS—Inner Tube.
Akron Equipment Co., Akron, Ohio.
National Rubber Machinery Co., Akron, Ohio.

MOLDS—Mechanical Rubber Goods.
Adamson Machine Co., Akron, Ohio.
Hoggson & Pettis Mfg. Co., The, New Haven, Conn.
Mechanical Mold & Machine Co., Akron, Ohio.
Wade, Levi C., Lynn, Mass.

MOLDS AND CORES—Tires.
Adamson Machine Co., The Akron, Ohio.
Akron Equipment Co., Akron, Ohio.
Akron Standard Mold Co., Akron, Ohio.
Bridgwater Machine Co., The, Akron, Ohio.
Franz Foundry & Machine Co., Akron, Ohio.
India Machine & Rubber Mold Co., The, Akron, Ohio.
National-Erie Co., Erie, Pa.
National Rubber Machinery Co., Akron, Ohio.

MOLD WASH AND LUBRICANT.
Rubber Service Laboratories Co., The, Akron, Ohio.

NAPHTHAS.
Anderson-Prichard Oil Corporation, Akron, Ohio.

NIPPLES—Rubber.
Davidson Rubber Co., Boston, Mass.
Davol Rubber Co., Providence, R. I.
Seamless Rubber Co., The, New Haven, Conn.
United States Rubber Co., New York.
Whitall Tatum Co., New York.

OILS—Aniline.
National Aniline & Chemical Co., New York, N. Y.

OILS—Palm, etc.
Harshaw Chemical Co., The, Cleveland, Ohio.
Wishnick-Tumpeer, Inc., New York.

OIL—Poppy Seed.
McNulty, Joseph A., New York, N. Y.

OILS—Tar, Pine, Creosote, Rosin, Turpentine.
Harshaw Chemical Co., The, Cleveland, Ohio.
Wishnick-Tumpeer, Inc., New York.

OIL WELL SUPPLIES.
Linear Packing & Rubber Co., Inc., Philadelphia, Pa.

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Emerson Apparatus Co., Melrose, Mass.

OXIDE—Maroon.
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PACKING—Asbestos.
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Gutta Percha and Rubber, Limited, Toronto, Canada.
Home Rubber Co., Trenton, N. J.
Linear Packing & Rubber Co., Inc., Philadelphia, Pa.
Manhattan Rubber Mfg. Division, The, of Raybestos-Manhattan, Inc., Passaic, N. J.
New York Belting & Packing Co., New York.
Thermoid Rubber Co., Trenton, N. J.
United States Rubber Co., New York.
Western Rubber Co., Goshen, Ind.

PATTERN MAKERS.
Adamson Machine Co., The, Akron, Ohio.
Bridgwater Machine Co., The, Akron, Ohio.
Farrel - Birmingham Co., Inc., Ansonia, Conn.
Lake Erie Engineering Corporation, Buffalo, N. Y.
National-Erie Co., Erie, Pa.

PIGMENTS—Titanium.
Titanium Pigment Co., Inc., New York, N. Y.

PINE TAR.
Hall, C. P., Co., The, Akron, Ohio.
Harshaw Chemical Co., The, Cleveland, Ohio.
Wishnick-Tumpeer, Inc., New York.

PITCH.
Harshaw Chemical Co., The, Cleveland, Ohio.
Wishnick-Tumpeer, Inc., New York.

PLANTATION MACHINERY.
Farrel - Birmingham Co., Inc., Ansonia, Conn.
Farrel - Birmingham Co., Inc., Derby, Conn.

PLASTER OF PARIS.
Hammill & Gillespie, Inc., New York, N. Y.

PLASTOMETER.
Pusey & Jones Corporation, The, Wilmington, Del.

PLATENS—Steam.
Adamson Machine Co., The, Akron, Ohio.
Dunning & Boschert Press Co., Inc., Syracuse, N. Y.
Erie Foundry Co., Erie, Pa.
Farrel - Birmingham Co., Inc., Ansonia, Conn.
Farrel - Birmingham Co., Inc., Derby, Conn.
French Oil Mill Machinery Co., Piqua, Ohio.
Lake Erie Engineering Corporation, Buffalo, N. Y.
National-Erie Co., Erie, Pa.
Southwark Foundry & Machine Co., Philadelphia, Pa.
Thropp, William R., Son's Co., Trenton, N. J.
Utility Manufacturing Co., Cudahy, Wis.
Watson-Stillman Co., The, New York.
Wood, R. D., & Co., Philadelphia, Pa.

PLUMBERS' SUPPLIES.
Acme Rubber Mfg. Co., Trenton, N. J.
Canfield Co., H. O., Bridgeport, Conn.
Canfield Rubber Co., Bridgeport, Conn.

PLUMBERS' SUPPLIES (Cont'd).
Essex Rubber Co., Trenton, N. J.
Gutta Percha and Rubber, Limited, Toronto, Canada.
New York Belting & Packing Co., New York.
Tingley-Reliance Rubber Corp., Rahway, N. J.
United States Rubber Co., New York.

PONCHOS.
Archer Rubber Co., Milford, Mass.
Chicago Rubber Clothing Co., Racine, Wisconsin.
United States Rubber Co., New York.

POWER TRANSMISSION MACHINERY.
American Tool & Machine Co., Boston, Mass.

PRESSES—Bakelite.
Erie Foundry Co., Erie, Pa.
Lake Erie Engineering Corporation, Buffalo, N. Y.
Terkelsen Machine Co., Boston, Mass.

PRESSES—Baling.
Lake Erie Engineering Corporation, Buffalo, N. Y.

PRESSES—Bead.
Erie Foundry Co., Erie, Pa.
Farrel - Birmingham Co., Inc., Ansonia, Conn.
Lake Erie Engineering Corporation, Buffalo, N. Y.
Nagle Machine Co., Erie, Pa.
National-Erie Co., Erie, Pa.
Southwark Foundry & Machine Co., Philadelphia, Pa.
Utility Manufacturing Co., Cudahy, Wis.
Wood, R. D., & Co., Philadelphia, Pa.

PRESSES—Belt.
Erie Foundry Co., Erie, Pa.
Farrel - Birmingham Co., Inc., Ansonia, Conn.
Farrel - Birmingham Co., Inc., Derby, Conn.
Lake Erie Engineering Corporation, Buffalo, N. Y.
Southwark Foundry & Machine Co., Philadelphia, Pa.

PRESSES—Heater.
Adamson Machine Co., The, Akron, Ohio.
Akron Equipment Co., The, Akron, Ohio.
Franz Foundry & Machine Co., The, Akron, Ohio.
Lake Erie Engineering Corporation, Buffalo, N. Y.
Nagle Machine Co., Erie, Pa.
National-Erie Co., Erie, Pa.
Southwark Foundry & Machine Co., Philadelphia, Pa.
Wood, R. D., & Co., Philadelphia, Pa.

PRESSES—Hydraulic.
Erie Foundry Co., Erie, Pa.
Farrel - Birmingham Co., Inc., Derby, Conn.
French Oil Mill Machinery Co., Piqua, Ohio.
Lake Erie Engineering Corporation, Buffalo, N. Y.
Nagle Machine Co., Erie, Pa.
National-Erie Co., Erie, Pa.
Robertson, John, Co., Inc., Brooklyn, N. Y.
Terkelsen Machine Co., Boston, Mass.

PRESSES—Lead Encasing.
Lake Erie Engineering Corporation, Buffalo, N. Y.
Robertson, John, Co., Inc., Brooklyn, N. Y.

PRESSES—Molding.
Erie Foundry Co., Erie, Pa.
Lake Erie Engineering Corporation, Buffalo, N. Y.
Terkelsen Machine Co., Boston, Mass.

PRESSES—Mechanical Molding.
Terkelsen Machine Co., Boston, Mass.

PRESSES—Packing.
Black Rock Mfg. Co., The, Bridgeport, Conn.
Lake Erie Engineerng Corporation, Buffalo, N. Y.

PRESSES—Tiling.
Erie Foundry Co., Erie, Pa.
Lake Erie Engineering Corporation, Buffalo, N. Y.
Utility Manufacturing Co., Cudahy, Wis.

PRESSES—Tire.
Adamson Machine Co., The, Akron, Ohio.
Akron Equipment Co., The, Akron, Ohio.
Dunning & Boschert Press Co., Inc., Syracuse, N. Y.
Lake Erie Engineering Corporation, Buffalo, N. Y.
National-Erie Co., Erie, Pa.
Southwark Foundry & Machine Co., Philadelphia, Pa.
Watson-Stillman Co., The, New York.
Wood, R. D., & Co., Philadelphia, Pa.

PRESSES—Tire Rimming.
Adamson Machine Co., The, Akron, Ohio.
Lake Erie Engineering Corporation, Buffalo, N. Y.
Nagle Machine Co., Erie, Pa.
Southwark Foundry & Machine Co., Philadelphia, Pa.

PRESSES—Tire Vulcanizing.
Adamson Machine Co., The, Akron, O.
Akron Equipment Co., The, Akron, O.
Lake Erie Engineering Corporation, Buffalo, N. Y.
Nagle Machine Co., Erie, Pa.
National-Erie Co., Erie, Pa.
Southwark Foundry & Machine Co., Philadelphia, Pa.
Wood, R. D., & Co., Philadelphia, Pa.

PRESSES—Toggle.
Dunning & Boschert Press Co., Inc., Syracuse, N. Y.
Lake Erie Engineering Corporation, Buffalo, N. Y.
Terkelsen Machine Co., Boston, Mass.

PRESSES—Vulcanizing.
Adamson Machine Co., The, Akron, Ohio.
Dunning & Boschert Press Co., Inc., Syracuse, N. Y.
Erie Foundry Co., Erie, Pa.
Farrel - Birmingham Co., Inc., Ansonia, Conn.
Farrel - Birmingham Co., Inc., Derby, Conn.
French Oil Mill Machinery Co., Piqua, Ohio.
Lake Erie Engineering Corporation, Buffalo, N. Y.
National-Erie Co., Erie, Pa.
Robertson, John, Co., Inc., Brooklyn, N. Y.
Southwark Foundry & Machine Co., Philadelphia, Pa.
Terkelsen Machine Co., Boston, Mass.
Thropp, William R., Son's Co., Trenton, N. J.
Utility Manufacturing Co., Cudahy, Wis.
Watson-Stillman Co., The, New York.
Wood, R. D., & Co., Philadelphia, Pa.

PUMICE.
Hammill & Gillespie, Inc., New York, N. Y.
Harshaw Chemical Co., The, Cleveland, Ohio.

PUMP RINGS AND SLEEVES.
Linear Packing & Rubber Co., Inc., Philadelphia, Pa.

PUMPS.
Adamson Machine Co., The, Akron, Ohio.
Dunning & Boschert Press Co., Inc., Syracuse, N. Y.
Farrel - Birmingham Co., Inc., Derby, Conn.
French Oil Mill Machinery Co., Piqua, Ohio.
Lake Erie Engineering Corporation, Buffalo, N. Y.
Robertson, John, Co., Inc., Brooklyn, N. Y.
Southwark Foundry & Machine Co., Philadelphia, Pa.
Watson-Stillman Co., The, New York.

PUMPS—Centrifugal.
Southwark Foundry & Machine Co., Philadelphia, Pa.

RACKS—Cooling.
Economic Steel Rack Co., Everett, Mass.

RACKS—Storage.
Economic Steel Rack Co., Everett, Mass.

RACKS AND FRAMES.
Day, J. H., Co., The, Cincinnati, Ohio.
Economic Steel Rack Co., Everett, Mass.
Hoggson & Pettis Mfg. Co., New Haven, Conn.

RECLAIMED RUBBER.
Clapp, E. H., Rubber Co., Boston, Mass.
Manhattan Rubber Mfg. Division, The, of Raybestos-Manhattan, Inc., Passaic, N. J.
Nearpara Rubber Co., Trenton, N. J.
New Jersey Rubber Co., Lambertville, N. J.
Pequanoc Rubber Co., Butler, N. J.
Philadelphia Rubber Works Co., The, Oaks, Montgomery County, Pa.
Rubber Regenerating Co., Naugatuck, Conn.
Somerset Rubber Reclaiming Works, New Brunswick, N. J.
Vulcan Recovery Co., Trenton, N. J.
Xylos Rubber Co., Akron, Ohio.

RECLAIMING MACHINERY.
Adamson Machine Co., The, Akron, Ohio.
American Process Co., New York.
Biggs Boiler Works Co., The, Akron, Ohio.
Day, J. H., Co., The, Cincinnati, Ohio.
Erie Foundry Co., Erie, Pa.
Farrel - Birmingham Co., Inc., Ansonia, Conn.
Farrel - Birmingham Co., Inc., Derby, Conn.
Housatonic Machine & Tool Co., Bridgeport, Conn.
Nagle Machine Co., Erie, Pa.
National-Erie Co., Erie, Pa.
Royle, John, & Sons, Paterson, N. J.

For Complete Addresses See Advertisements—Index Page 144

RUBBERIZED FABRICS OF
OUTSTANDING QUALITY
FOR EVERY PURPOSE

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HARRY M. DANNENBAUM, Pres.
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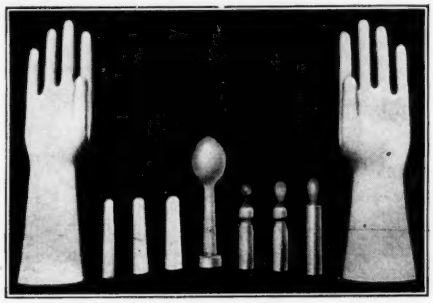
Largest exclusive manufacturers of Vitrified Porcelain forms for Rubber Dipped Goods. Most Manufacturers use our forms. Repeat orders testify to high quality.
Manager's experience 26 years.
Write us your wants.



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Genasco
Hydrocarbon

Produced by Experts

The excellence of Genasco Hydrocarbon is due largely to the strict supervision of modern laboratory technicians.

Its uniform quality is assured by aging tests.

Genasco Hydrocarbon, due to its base, retards the cure less, with the result that a smaller amount of accelerator can be used.

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Sanitary Goods
Infants' Pants
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Rubber Aprons
Bathing Caps

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Factory: Middletown, Conn. New York Office: 150 Madison Ave.

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FOR MECHANICAL RUBBER GOODS

Specialists in the Manufacture of Steel Molds

Molds for

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Die Sinkers and Engravers. Medallion Dies a Specialty.

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Quality Guaranteed
MOLDED RUBBER GOODS
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GLASSWARE

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GLASS WORKS SOUTH MILLVILLE, N. J. MILLVILLE, N. J.

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NEW YORK BOSTON PHILADELPHIA CHICAGO BUENOS AIRES, A. R. SAN FRANCISCO SYDNEY, N. S. W.

BUYERS' GUIDE

RECLAIMING WATER SEPARATORS.

American Process Co., New York.

RECORDING INSTRUMENTS—Pressure, Temperature.

Bristol Co., The, Waterbury, Conn.
Taylor Instrument Cos., Rochester, N. Y.

RED OXIDE.

Binney & Smith Co., New York.
Hall, C. P., Co., The, Akron, Ohio.
Hammill & Gillespie, Inc., New York, N. Y.
Harshaw Chemical Co., The, Cleveland, Ohio.
Huber, J. M., Inc., New York.
McNulty, Joseph A., New York.
Waldo, E. M. & F., Inc., Muirkirk, Md.
Whittaker, Clark & Daniels, Inc., New York.
Williams, C. K., & Co., Easton, Pa.
Wishnick-Tumpeer, Inc., New York.

REFINERS.

Erie Foundry Co., Erie, Pa.
Farrel - Birmingham Co., Inc., Ansonia, Conn.
Farrel - Birmingham Co., Inc., Derby, Conn.
Nagle Machine Co., Erie, Pa.
National-Erie Co., Erie, Pa.

REPAIR STOCK.

General Tire & Rubber Co., Akron, Ohio.
United States Rubber Co., New York.

RESIN.

Wishnick-Tumpeer, Inc., New York.

RETREADING EQUIPMENT—Tire

Franz Foundry & Machine Co., The, Akron, Ohio.
National-Erie Co., Erie, Pa.
National Rubber Machinery Co., Akron, Ohio.

REVERTEX.

Revertex Corporation of America, New York, N. Y.

RINGS—Bead Setting.

Akron Standard Mold Co., Akron, Ohio.
Bridgwater Machine Co., The, Akron, Ohio.
India Machine & Rubber Mold Co., The, Akron, Ohio.
National-Erie Co., Erie, Pa.

RINGS—Mold Side.

National-Erie Co., Erie, Pa.

ROLLERS AND STITCHERS—Hand.

Hoggson & Pettis Mfg. Co., New Haven, Conn.
Wellman Co., Medford, Mass.

ROLLS—Chilled.

Curtis & Marble Machine Co., Worcester, Mass.
Farrel - Birmingham Co., Inc., Ansonia, Conn.
Farrel - Birmingham Co., Inc., Derby, Conn.
Nagle Machine Co., Erie, Pa.
Textile-Finishing Machinery Co., Providence, R. I.

ROLLS—Engraving.

Farrel - Birmingham Co., Inc., Ansonia, Conn.
Farrel - Birmingham Co., Inc., Derby, Conn.
Hoggson & Pettis Mfg. Co., New Haven, Conn.

ROLLS—Rubber Covered.

Acme Rubber Mfg. Co., Trenton, N. J.
Archer Rubber Co., Milford, Mass.
Gutta Percha and Rubber, Limited, Toronto, Canada.
Manhattan Rubber Mfg. Division, The, of Raybestos-Manhattan, Inc., Passaic, N. J.
New York Belting & Packing Co., New York.
United States Rubber Co., New York.

ROLLS—Wringer.

Gutta Percha & Rubber, Ltd., Toronto, Canada.
New York Belting & Packing Co., New York.
United States Rubber Co., New York.
Western Rubber Co., Goshen, Ind.

ROSIN.

Harshaw Chemical Co., The, Cleveland, Ohio.
Wishnick-Tumpeer, Inc., New York.

ROTTEN STONE.

Hammill & Gillespie, Inc., New York, N. Y.
Harshaw Chemical Co., The, Cleveland, Ohio.
Whittaker, Clark & Daniels, Inc., New York.

RUBBER—Brokers.

Dunbar, F. W., & Co., Inc., New York.
Hentz, H., & Co., New York.
Jacoby, Ernest, Boston, Mass.

RUBBER—Importers and Exporters.

Chalfin Rubber Trading Co., Inc., New York.
Continental Rubber Co., New York.
Hankin, Geo., & Co., London, England. (Weeks, Handy & Co., Inc., New York).
Hilton, Wallace & Co., Ltd., London, England.
Hirsch, Adolph, & Co., Inc., New York.
Muehlstein, H., & Co., Inc., New York.
Wilson, Charles T., Co., Inc., New York.

RUBBER—Washed and Dried.

Acushnet Process Co., New Bedford, Mass.

RUBBER BANDS.

Davol Rubber Co., Providence, R. I.
Easthampton Rubber Thread Co., Easthampton, Mass.
Plymouth Rubber Co., Inc., Canton, Mass.

RUBBER BANDS (Continued).

Seamless Rubber Co., The, New Haven, Conn.
United States Rubber Co., New York.

RUBBER COATED CLOTHS.

Aldan Rubber Co., Philadelphia, Pa.
Archer Rubber Co., Milford, Mass.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Canfield Rubber Co., The, Bridgeport, Conn.
Chicago Rubber Clothing Co., Racine, Wisconsin.
Meade Rubber Co., Stoughton, Mass.
Mechanical Fabric Co., Providence, R. I.
Pirelli, Milan, Italy.
Plymouth Rubber Co., Inc., Canton, Mass.
Pocono Rubber Cloth Co., The, Trenton, N. J.
Rand Rubber Co., Inc., Brooklyn, N. Y.
United States Rubber Co., New York.

RUBBER COVERING MACHINES.

New England Butt Co., Providence, R. I.

RUBBER EXCHANGE—Members.

Dunbar, F. W., & Co., Inc., New York.
Hentz, H., & Co., New York.
Muehlstein, H., & Co., Inc., New York.
Wilson, Charles T., Co., Inc., New York.

RUBBER SUBSTITUTES.

Ashley, T. C., & Co., Boston, Mass.
Carter Bell Mfg. Co., New York.
Hall, C. P., Co., The, Akron, Ohio.
Jacoby, Ernest, Boston, Mass.
Stamford Rubber Supply Co., Stamford, Conn.
Tyson Bros., Inc., Woodbridge, N. J.

SANITARY GOODS.

Canfield Rubber Co., The, Bridgeport, Conn.
Omo Mfg. Co., The, Middletown, Conn.
Plymouth Rubber Co., Inc., Canton, Mass.
Rand Rubber Co., Inc., Brooklyn, N. Y.

SCLEROSCOPES.

Shore Instrument & Mfg. Co., The, Jamaica, N. Y.

SCRAP RUBBER.

Chalfin Rubber Trading Co., Inc., New York.
Cummings, Wm. H., & Sons, New York.
Muehlstein, H., & Co., Inc., New York.
Norton, M., & Co., Medford, Mass.

SECOND-HAND MACHINERY.

Albert, L., & Son, Trenton, N. J.
Bolling, Stewart, & Company, Cleveland, Ohio.

SECOND-HAND MACH'Y (Cont'd).

Norton, M., & Co., Medford, Mass.
Sherman, Geo. W., Akron, Ohio.
United Rubber Machinery Exchange, Newark, N. J.

SEWING MACHINES.

Curtis & Marble Machine Co., Worcester, Mass.

SHEET PACKING.

Linear Packing & Rubber Co., Inc., Philadelphia, Pa.

SHEETINGS.

Adams, H. J., Co., The, Akron, Ohio.
Callaway Mills, Inc., New York.
Lane, J. H., & Co., New York and Chicago.

SHERARDIZING.

National Sherardizing & Machine Co., The, Hartford, Conn.

SHOES—Canvas.

United States Rubber Co., New York, N. Y.

SIFTERS—Rotary.

Day, J. H., Co., The, Cincinnati, Ohio.

SILICA.

Hammill & Gillespie, Inc., New York, N. Y.
Whittaker, Clark & Daniels, Inc., New York.
Wishnick-Tumpeer, Inc., New York.

SKIVING MACHINES.

Nagle Machine Co., Erie, Pa.
National-Erie Co., Erie, Pa.
United Shoe Machinery Corporation, Boston, Mass.

SLITTERS—Belting Duck.

Cameron Machine Co., Brooklyn, N. Y.
Farrel - Birmingham Co., Inc., Ansonia, Conn.
Farrel - Birmingham Co., Inc., Derby, Conn.

SLITTING AND REWINDING MACHINES.

Cameron Machine Co., Brooklyn, N. Y.

SOAP BARK.

Harshaw Chemical Co., The, Cleveland, Ohio.
Wishnick-Tumpeer, Inc., New York.

SOAPSTONE.

Binney & Smith Co., New York.
Harshaw Chemical Co., The, Cleveland, Ohio.
Whittaker, Clark & Daniels, Inc., New York.
Williams, C. K., & Co., Easton, Pa.
Wishnick-Tumpeer, Inc., New York.

SOFTENERS.

Hall, C. P., Co., The, Akron, Ohio.
Montgomery, W. L., & Co., Boston, Mass.
Rubber Service Laboratories Co., The, Akron, Ohio.
Tasco Asphalt Co., Newark, N. J.

For Complete Addresses See Advertisements—Index Page 144

SUPERFINE SULPHUR

Specially prepared to meet the requirements of rubber manufacturers

Refined Flour Sulphur, 100% Pure. **Commercial Flour Sulphur, 99½% Pure.**

BOTH ARE UNEXCELLED IN FINENESS AND UNIFORMITY

Write for Samples, Prices and Pamphlet, "Real Facts About Sulphur"

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Complete Stock of Rubber-makers' Sulphur Carried in Akron

Rialto Building, St. Louis, Mo.

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Largest Rubberizers of Cloth in the World

RUBBER HEELS SHEET RUBBER GOODS
HOSPITAL SHEETINGS AUTO TOP MATERIALS
ELECTRICAL TAPES GEM DUCK

PLYMOUTH QUALITY RAINCOAT FABRICS

MOLDS *for* RUBBER HEELS *and* SOLES

WITH OUR MODERN MACHINERY EQUIPMENT AND LABOR SAVING DEVICES, WE CAN QUOTE THE HEEL AND SOLE MANUFACTURER ATTRACTIVE PRICES.

Immediate Shipment.

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H. N. RICHARDS TRENTON, N. J.

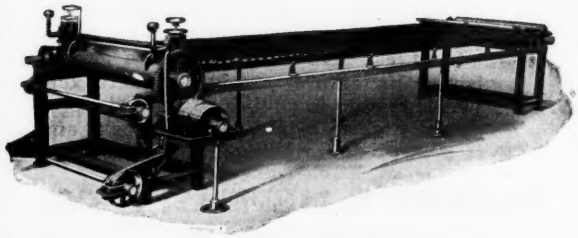
Materials *for* Rubber Industries

THE
H. J. ADAMS COMPANY

Second National Building AKRON, OHIO

THE EXTREMELY HEAVY CONSTRUCTION OF THESE

RUBBER SPREADING MACHINES



makes them particularly well adapted for applying thin successive coatings of rubber for the manufacture of high grade sheetings, raincoatings, offset blankets, etc.

MACHINES MADE IN WIDTHS FROM 50-in. to 80-in.

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304 Pearl St. PROVIDENCE, R. I.
Chicago Office: 140 South Dearborn Street, Chicago, Ill.

BUYERS' GUIDE

SOLE CUTTING MACHINES.

Wellman Company, The, Medford, Mass.

SOLES AND TAPS.

Plymouth Rubber Co., Inc., Canton, Mass.
United States Rubber Co., New York, N. Y.

SOLING—Crêpe.

Gutta Percha & Rubber, Ltd., Toronto, Canada.
Hankin, Geo., & Co., London, England. (Weeks, Handy & Co., Inc., New York).
Hilton, Wallace & Co., Ltd., London, England.
Jacoby, Ernest, Boston, Mass.
Plymouth Rubber Co., Inc., Canton, Mass.

SOLVENT RECOVERY APPARATUS.

Societe de Recherches et d'Exploitations Petroliferes, Paris 16e), France.

SOLVENTS.

Anderson-Prichard Oil Corporation, Akron, Ohio.
Hall, C. P., Co., The, Akron, Ohio.

SPECIALTIES—Rubber.

Canfield, H. O., Co., The, Bridgeport, Conn.
Canfield Rubber Co., The, Bridgeport, Conn.
Chicago Rubber Clothing Co., Racine, Wis.
Essex Rubber Co., Trenton, N. J.
Omo Manufacturing Co., Middletown, Conn.
Plymouth Rubber Co., Inc., Canton, Mass.
Rand Rubber Co., Inc., Brooklyn, N. Y.
Rhoades, R. W., Metaline Co., Inc., Long Island City, N. Y.
Seamless Rubber Co., The, New Haven, Conn.
Whitall Tatum Co., New York, N. Y.

SPLICING COMPOUNDS.

Boston Woven Hose & Rubber Co., Cambridge, Mass.
Canfield Rubber Co., Bridgeport, Conn.
Plymouth Rubber Co., Inc., Canton, Mass.
United States Rubber Co., New York.

SPREADERS.

Adamson Machine Co., The, Akron, Ohio.
American Tool & Machine Co., Boston, Mass.
Farrel-Birmingham Co., Inc., Derby, Conn.
National-Erie Co., Erie, Pa.

SPREADERS (Continued).

New England Butt Co., Providence, R. I.
Textile-Finishing Machinery Co., Providence, R. I.

STAMP GUM.

Gutta Percha & Rubber, Ltd., Toronto, Canada.
United States Rubber Co., New York.

STARCH—Corn.

Hammill & Gillespie, Inc., New York, N. Y.
Wishnick-Tumpeer, Inc., New York.

STEARIC ACID.

Binney & Smith Co., New York.
Harshaw Chemical Co., The, Cleveland, Ohio.

STITCHERS.

Hoggson & Pettis Mfg. Co., New Haven, Conn.

STOPPERS—Rubber.

Canfield Rubber Co., Bridgeport, Conn.
New York Belting & Packing Co., New York.
Rhoades, R. W., Metaline Co., Inc., Long Island City, N. Y.
Seamless Rubber Co., The, New Haven, Conn.
United States Rubber Co., New York.

STOPPLES—Screw (Water Bottle).

Schrader's, A., Son, Inc., Brooklyn, N. Y.

STRAINING MACHINES.

Erie Foundry Co., Erie, Pa.
Nagle Machine Co., Erie, Pa.
National-Erie Co., Erie, Pa.
National Rubber Machinery Co., Akron, Ohio.
Royle, John, & Sons, Paterson, N. J.

STRETCHERS—Belting.

Farrel-Birmingham Co., Inc., Ansonia, Conn.
Farrel-Birmingham Co., Inc., Derby, Conn.
Hoggson & Pettis Mfg. Co., New Haven, Conn.
Southwark Foundry & Machine Co., Philadelphia, Pa.

SULPHUR.

Battelle & Renwick, New York.
Harshaw Chemical Co., The, Cleveland, Ohio.

SULPHUR (Continued).

St. Louis Sulphur & Chemical Co., St. Louis, Mo.
Southern Acid & Sulphur Co., Inc., St. Louis, Mo.
White, T. & S. C., Co., New York.
Whittaker, Clark & Daniels, Inc., New York.
Wishnick-Tumpeer, Inc., New York.

SULPHUR CHLORIDE.

Ashley, T. C., & Co., Boston, Mass.
Carter Bell Mfg. Co., New York.
Harshaw Chemical Co., The, Cleveland, Ohio.
Stamford Rubber Supply Co., Stamford, Conn.
Tyson Bros., Inc., Woodbridge, N. J.
Wishnick-Tumpeer, Inc., New York.

SYRINGES—Fountain.

Davidson Rubber Co., Boston, Mass.
Davol Rubber Co., Providence, R. I.
Seamless Rubber Co., The, New Haven, Conn.
United States Rubber Co., New York.

TABLES—Stripping.

Akron Standard Mold Co., Akron, Ohio.
National-Erie Co., Erie, Pa.

TALC.

Binney & Smith Co., New York.
Hall, C. P., Co., The, Akron, Ohio.
Hammill & Gillespie, Inc., New York, N. Y.
Harshaw Chemical Co., The, Cleveland, Ohio.
Vanderbilt, R. T., Co., Inc., New York.
Waldo, E. M. & F., Inc., Muirkirk, Md.
Whittaker, Clark & Daniels, Inc., New York.
Williams, C. K., & Co., Easton, Pa.
Wishnick-Tumpeer, Inc., New York.

TAPE—Adhesive.

Seamless Rubber Co., The, New Haven, Conn.

TAPE—Cloth Friction.

Boston Woven Hose & Rubber Co., Cambridge, Mass.

TAPE—Cloth Friction (Continued)

Canfield Rubber Co., Bridgeport, Conn.
Home Rubber Co., Trenton, N. J.
Plymouth Rubber Co., Inc., Canton, Mass.
United States Rubber Co., New York.

TAPE—Insulating.

Canfield Rubber Co., Bridgeport, Conn.
Plymouth Rubber Co., Inc., Canton, Mass.
Seamless Rubber Co., The, New Haven, Conn.
United States Rubber Co., New York.

TAPE—Tire.

Adams, H. J., Co., The, Akron, Ohio.

TECHNOLOGISTS—Consulting. Rubber.

Maywald, F. J., Carlstadt, N. J.
Olin, R. R., Laboratories, Akron, Ohio.

TEETHING RINGS.

Rhoades, R. W., Metaline Co., Inc., Long Island City, N. Y.

TESTING MACHINES.

Shore Instrument & Mfg. Co., The, Jamaica, N. Y.
Stowe & Woodward Co., Newton Upper Falls, Mass.

THERMOMETERS.

Bristol Co., The, Waterbury, Conn.

THREAD—Rubber.

Easthampton Rubber Thread Co., Easthampton, Mass.
Mechanical Fabric Co., Providence, R. I.
United States Rubber Co., New York.

TILING.

Gutta Percha and Rubber, Ltd., Toronto, Canada.
Manhattan Rubber Mfg. Division, The, of Raybestos-Manhattan, Inc., Passaic, N. J.
New York Belting & Packing Co., New York.
Puritan Rubber Mfg. Co., Trenton, N. J.
United States Rubber Co., New York.
Western Rubber Co., Goshen, Ind.

For Complete Addresses See Advertisements—Index Page 144

RUB-ER-RED

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A new and superior coloring agent for rubber compounding.

Ferric Oxide 99% **Specific Gravity 5.15**

We are glad to send samples and complete analysis.

RUB-ER-RED sets a new high standard of tinting strength; contains no soluble salts; its acid, copper and manganese content are below the allowable limits of any known rubber specifications; is free of alkali; free of grit; shows a retention of less than 1% on 325 mesh screen; is soft in texture; stable and inert; disperses readily in rubber compounds; produces a clear bright-colored stock, and is always uniform in all characteristics.

C. K. WILLIAMS & COMPANY
Easton, Pa.

GEORGE S. MEPHAM & CO.
East St. Louis, Ill.

Manufacturers of a Complete Line of
Rainproof Coats for the Wholesale Trade

QUALITY AND WORKMANSHIP OF THE BEST

The BADGER RAINCOAT CO.
PORT WASHINGTON WISCONSIN

Show Rooms for the Convenience of Buyers at
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LIQUID RUBBER LATEX

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Brazil Manicoba, and Sheet Rubber, Crude and Washed, Our Specialty.
Direct Receivers of Eastern Plantation Rubber.
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EASTHAMPTON RUBBER THREAD CO.
EASTHAMPTON, MASS.

Original Makers of RUBBER THREAD in America
Also Makers of RUBBER BANDS
Both THREAD and BANDS are made only of the best
UPRIVER FINE PARA RUBBER

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TRIMMERS—Sole and Heel.
Morris, T. W., Chicago, Ill.
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Utility Manufacturing Co., Cudahy, Wis.

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Bridgwater Machine Co., The, Akron, Ohio.

TRIMMERS—Tire Flap.
Bridgwater Machine Co., The, Akron, Ohio.

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National-Erie Co., Erie, Pa.

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Manhattan Rubber Mfg. Division, The, of Raybestos-Manhattan, Inc., Passaic, N. J.
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Schrader's, A., Son, Inc., Brooklyn, N. Y.

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Lake Erie Engineering Corporation, Buffalo, N. Y.
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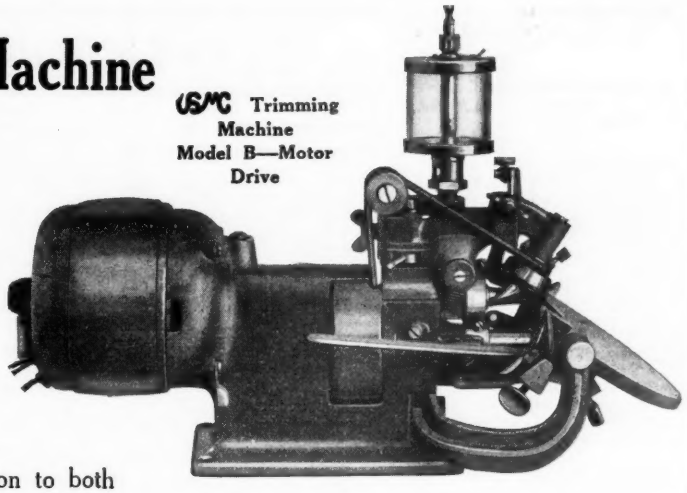

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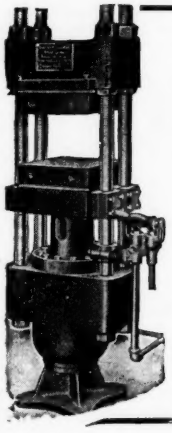

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Seamless Rubber Co., The, New Haven, Conn.
United States Rubber Co., New York.
Whitall Tatum Co., New York.

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Harshaw Chemical Co., The, Cleveland, Ohio.

WAX—Montan.

Wishnick-Tumpeer, Inc., New York.

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Waldo, E. M. & F., Inc., Muirkirk, Md.
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Wishnick-Tumpeer, Inc., New York.

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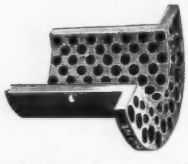

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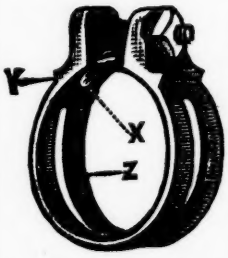

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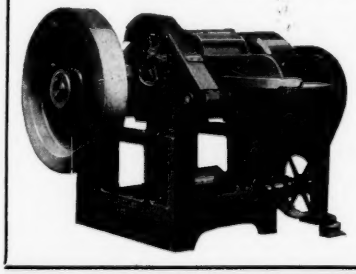

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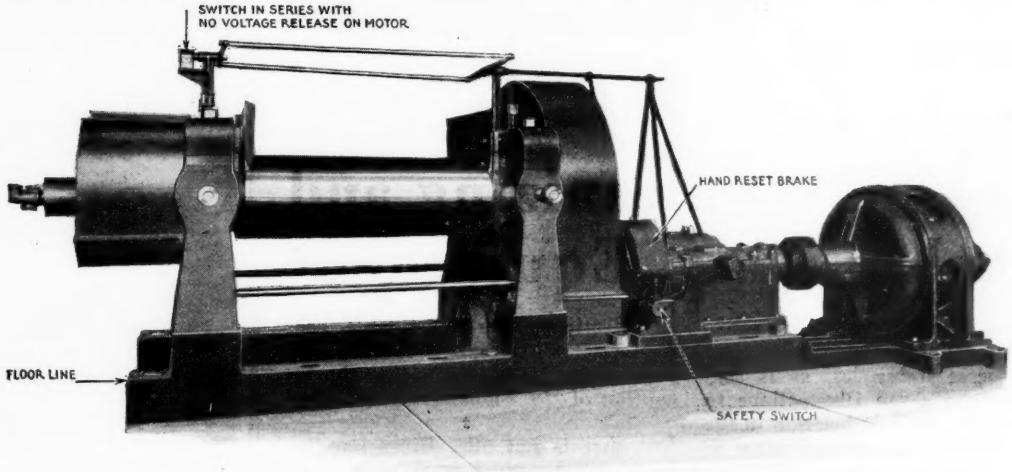


20″ and 22″ x 60″ Individual Motor-Driven Grinder or Mixer with Type R.N. Herringbone Gear Drive.

We are specializing in manufacturing Individual Motor-Driven Mills, Warmers, Crackers, Refiners and Washers. They are made with gigs so parts are interchangeable, and are made in quantities. Heavy frames with Steel Gibs in the top. The bedplate is very heavy and contains Mill Drive and Motor.

DRIVE

We do not use a separate herringbone gear drive, as the gear drive is built in the machine. We wish to call your attention to the low speed Jack Shaft with high torque being at the lowest point in the bedplate, which overcomes vibration and increases efficiency. This shaft has three (3) ring oiling bearings, babbitted and of the Removable Sleeve Type. The Herringbone Gears are enclosed in a cast iron oil tight case. At the end of the pinion shaft is one of our Hand Reset Brakes for safety. Safety Guarding is Solid Metal Guards over stuffing boxes, connecting gears, master gear and pinion.

Stopping Mechanism:—Stopping Mill in 10″ Roll Travel

In Stock for Prompt Shipment

MILLS AND WARMERS

6″ x 16″ with 5 H.P. Motor, 900 R.P.M.
14″ x 30″ " 25 " " 900 "
16″ x 42″ " 60 " " 720 "
18″ x 50″ " 75 or 100 H.P. Motor, 720 R.P.M.
20 & 22x60″ with 125 or 150 H.P. Motor, 720 R.P.M.

WILLIAM R. THROPP SON'S CO.

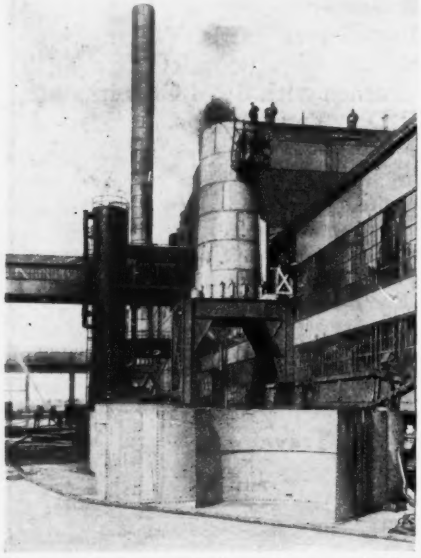
Trenton **New Jersey, U. S. A.**

Water supply line furnished and installed by Biggs for the Goodyear Tire & Rubber Company, Akron, Ohio. Biggs electrically welded or riveted steel pipe is ideal as a permanent and reliable water conduit. All sizes, 30" diameter and larger.

Biggs Is a Source of Supply on more than Vulcanizing and Devulcanizing Equipment

Biggs does turn out the widest range of equipment for the rubber and other process industries, as is suggested by the seven illustrations to the right. A strategic location in the Rubber City has nominated Biggs as the "first thought" for consultation—for the intelligent interpretation of specifications — for dependable, economic service on all problems that have successively arisen since the inception of the industry.

But that is not all. Biggs handles in its entirety much work of less frequent, but important consequence to you. The Goodyear water supply line (above) is one such case. The steel stacks pictured below form another. Biggs' service covers every sort of product that can be fabricated of steel plate, welded or riveted, up to 1½" thickness. And every job produced by Biggs is an expression of the same thorough artisanry, exhaustive experience, and complete facilities that have made Biggs equipment the acknowledged standard throughout the world of rubber.



Biggs maintains a skilled erecting organization which handles large smoke stacks and breechings anywhere in the United States and Canada. Here are several 10 ft. diameter by 185 ft. stacks going up.

"BUILT BY BIGGS"
Riveted or Welded

Vulcanizers: Horizontal and Vertical; Single Shell and Jacketed; with Quick-Opening or Bolted Type Doors.

Devulcanizers: Standard Horizontal Rotary type; Stationary, Vertical, and Horizontal with Agitators.

Special Welded Process Retorts, Tanks, etc., of every description.

Steel Stacks, Breechings, Miscellaneous Plate Work.

THE BIGGS BOILER WORKS COMPANY
AKRON, OHIO

New York Detroit Chicago

Battery of Biggs Inner Tube Vulcanizers

Welded Vertical High Pressure Devulcanizers

Biggs Horizontal Vulcanizers for Druggist Sundries Field

Biggs 10-ft. Diameter Vulcanizer with Quick-Opening Door

Special Spherical Rotary Devulcanizer

Jacketed Vulcanizer without Stay Bolts

Standard Jacketed Rotary Devulcanizer

The illustrations above are among those shown in our folder, "Biggs Special Process Retorts." May we send you a copy?

BIGGS VULCANIZERS *The "cure" for your troubles*

BOILER WORKS CO. The Biggs EST 1867 AKRON OHIO

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